

Measuring Market Inequality and Redistribution Accounting For In-Kind Benefits from Health and Education

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ABSTRACT: Net contributor or net beneficiary of tax and benefit system? Who contributes, who receives, and for how much? To answer these questions, our contribution to the literature on inequality and redistribution, based on the distributional account methodology, are threefold: (i) taking into account all transfers, based on national account, to have a balanced approach to the redistribution, (ii) to micro-simulate and compute monetary valuation of in kind benefits as health and education, and collective public service, (iii) to display new results on inequality by diploma, age, socio-professional category and geographic area thanks to our database (a match between LFS and administrative data) which provides a great variety of socio-demographic variable.

A first finding is that the outcome of extended redistribution is positive for a large part of the population: 60% of households are net beneficiaries. If the profile of tax system is not progressive and even regressive at the ends, that of transfers is roughly lump sum type, which leads to a powerfully redistributive net effect. Net transfers are twice as large with the extended approach as with the traditional monetary approach. However, in strictly monetary terms, the proportion of “winners” drops to 32%. Equal access to public services is the essential condition for accepting the tax. Otherwise middle classes tend to consider themselves, as seen in yellow vest protest, as doubly harmed by the lower-than-average share of market income and net negative effect of public transfers.

Finally, an analysis of inequalities and redistribution over the pseudo life cycle is carried out, taking into account, beyond the age, the diploma, family structure, and urban units. In the end, what makes inequalities in France lower than in many other part of the world is the combination of less unequally distributed market incomes with the high level of public services. However, our work highlights a “tragedy of horizons”: pensions and health (nearly half of the public transfers), benefit around 73% at 60 years old and more, so that only 20% of those under 60 benefit from net monetary redistribution. Confidence in the sustainability of pension and health systems is the key to tax consent for working-age generations.

JEL Classification : E01, D63, O57. **Keywords:** Inequality, Redistribution, Distributional National Account, Health, Education.

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I. Introduction and main findings

Motivation. A feeling has spread among some of our fellow citizens of not having a fair return on the taxes paid. Facing it, statisticians and economists are often urged to document to who pays what and who benefits from what. This is a simple question with a complicated answer because public action is not only a matter of monetary transfers. Taxes are levied by the public authorities above all to finance collective goods and services of general interest. Their primary function is universal, such as access to public services.

Seen from a purely monetary point of view, the exercise appears at first glance simpler. It could be summed up to calculate the gap between market income on the one hand, and disposable income on the other hand. The difference between the two is social contributions and direct taxes such as income tax and payment of family benefits or minimum social benefits. Reality is more complex. What are the taxes to be taken into account? Income tax, that goes without saying, but what about property tax, consumption tax or corporate tax? As for the transfers received, social minima, family or housing allowances are integrated without doubt but we cannot ignore education and health, for which free access is an important counterpart to taxes and contributions such as in most European countries.

Another question, in which category should we classify pensions? That of primary incomes, if we consider them as deferred income, or as a transfer operated by social protection systems? The way these questions are answered have a direct impact on the results and international comparisons.

Simply raising these issues, and considering that any tax that is levied ultimately benefits households, directly or indirectly, brings to the conclusion that redistribution can only be measured by confronting each other and integrating all the public transfers. Therefore, it is crucial to adopt the widest possible perspective including all modes of financing as well as all types of public benefits or services. Additionally, incomplete coverage leads to biasing international comparisons, given the very unequal scope of public action and the very varied methods of its financing. For example, ignoring public education and health services leads to underestimating redistribution in European countries where they are particularly extensive. Or, not to take into account taxes on products skews the comparison between European countries and the United States, this form of levy, penalizing for low incomes, and being almost absent over there.

To overcome these challenges, the measurement of inequalities and redistribution should be comprehensive by adding, to the monetary transfers usually taken into account in such studies, at least those provided freely by national education, higher education and the public health system.

Contributions. This paper develops a precise and comprehensive methodological framework and specifying hypotheses on how public services are valued and how the various transfers in the exhaustive field of redistribution are allocated to households. We build a distributional national account (DNA) for France between 2008 and 2019, based on an extended approach to redistribution, and consistent with national accounts. Our main contribution to the literature (that we review in the next section) is: (i) to take into account all transfers, based on national account, to have a balanced approach to the redistribution, (ii) to micro-distribute all kind benefits and collective public service with micro-data and minimal assumptions, (iii) to display new results on inequality by

diploma, age, and geographic area thanks to our database which provides a great variety of socio-demographic variables.

Methodology and data. We build our work on the methodology of the expert group report on inequalities and redistribution initiated by INSEE, the French national institute of statistics (Germain, André, Blanchet, 2021), following recent work on DNA by Piketty, Saez and Zucman (2018) and pioneering work of INSEE in the 1990s. In a recent institutional work published by INSEE on distributional accounts by tenth of income (Accardo, André, Billot, Germain, Sicsic, 2021) our main finding was that close to two-third of households are net beneficiaries of the extended redistribution. In particular, middle income household appears net beneficiary of the extended redistribution while they are not with the usual only monetary approach.

In this paper, we deepen this approach and shed a new light on inequalities and redistribution for France. Our results are based on a more detailed breakdown of national income, by twentieth, allowing a better understanding of the formation of the primary inequalities, the mitigating role of public transfers and the contribution of the education system and social protection schemes. The main data used are from the French *Enquête Revenus Fiscaux et Sociaux (ERFS)*, a match between fiscal records, social administrative data, and the labor force survey (LFS), covering more than 100,000 people each year. This database is also matched with data on consumption, wealth, education and local amenities. We also use administrative data from health and a survey on family transfers.

Results. A first finding is that the redistribution appears almost twice broader than with the usual monetary approach. This is mainly due to public services which are equivalent to a quasi-lump-sum basis and in kind benefit that are even more concentrated on low and middle income, especially Education and Health. In terms of pseudo Gini index, the main drivers of inequality reduction are in kind benefits (50% of overall inequality attenuation) followed by benefits in cash (one third of inequality reduction).

While middle income group benefits on average more from extended redistribution, we highlight a great disparity of situation within the same strata of income for middle income group. While 60% of individual benefits from extended redistribution, in strictly monetary terms, the proportion of “winners” drops to 32% with our extended framework. Equal access to public services is the essential condition for accepting the tax. Otherwise middle classes tend to consider themselves, as doubly harmed by the lower-than-average share of market income and net negative effect of public transfers. This give a possible explanation of yellow vest protest.

Further, an analysis of inequalities and redistribution by age and diploma cohorts is carried out to address life cycle issues. We show for instance that our bachelor and above category of household receive 3.3 times more market income than non-graduates in the 50-64 age bracket, compared to a ratio of 1 to 2.5 in the 18-29 age bracket. Bachelor and more income is multiplied by 2.4 between the youngest (18-29) and the most experienced (50-64 brackets); the ratio is 1.8 for non-graduates. In terms of the extended standard of living, the increase of income between the two extreme categories of active age is limited to +25% for the no diploma group (+0.6% per year) against a doubling for the most graduates. We show also that while the market incomes of couples without children are 40% higher than those of couples with three or more children, the extended living standards are equivalent. On territorial issues, households residing in Greater Paris receive more than 50% of primary income than those in Mid-Sized Cities, the gap being greatest in the 50-64 age group where it reaches 61%. Redistribution narrows this range by almost half.

In the end, what makes inequalities in France lower than other countries such as U.S.A (see Piketty, Saez, Zucman, 2018) is the combination of less unequally distributed market incomes with the high level of public services rather than the tax profile itself. Indeed, the global profile of tax system is not progressive and even slightly regressive at the very ends of the distribution. It is the combination of transfers paid roughly proportional to income transfer received with lump sum profile, both at high level (55% of NNI) which leads to a powerfully redistribution and a positive balance for a large majority of citizens. However, our results on age cohorts highlight a “tragedy of horizons”: pensions and health (nearly half of the public transfers), benefit around 73% at 60 years old and more, so that only 20% of those under 60 benefit from net monetary redistribution. Confidence in the sustainability of pension and health systems is the key to tax consent for working-age generations.

The rest of the paper is structured as follows. Section II presents the related work and literature. Section III describes the data used and the method. The reader familiar with the methodology and data should skip directly to Section IV presents the results by income group on 2018. Section V presents results by fine cohorts of age, and section VI by 25 groups crossing age and diploma. The last Section deals with family structure, area of residence and gender issues

II. Related works and literature

Effort to complete and improve measurement of inequalities and redistribution are intense, both from the academic world and from statistical institutes and international institutions. Our work is grounded on a well-developed but growing research work. This branch of literature of seek: i) to enable improved comparability over time and between countries by harmonizing definitions and concepts of income; ii) to complete usual measurement, for example adding a monetary valuation of individualizable public services to disposable income; ii) to bring the microeconomic data on the distribution of income into with those of national accounting, which, as earlier works showed, happen to be particular essential to properly measure high incomes.

Harmonization Efforts. The *Luxembourg Income Study* (LIS), launched in 1983 was the first large-scale initiative aimed at harmonizing micro-data on income. The project covers around 50 countries over five decades. The *Canberra Group*, initiated in 1996 by the Australian Bureau of Statistics, was set to define common methods within the statistical institutes and result in 2001, in a set of recommendations gather in *The Canberra Group Handbook* adopted by the International Labor Organization in 2003, and actualized in 2011 (The Canberra Group, 2001) together with the Conference of European Statisticians and the United Nations Economic Commission for Europe (The Canberra Group, 2011) A similar initiative, the *OECD Expert Group on Micro Statistics on Income, Consumption and Wealth* (EG ICW), published two guides in 2013 and initiated the *Income Distribution Database*. Several statistical institutes produce experimental statistics on this subject (*Statistics Netherlands*, 2014; *Eurostat*, 2018; *Statistics Canada*, 2018; *Australian Bureau of Statistics*, 2019), the majority of these statistics are based on surveys and only cover a part of national income. The main concept used to calculate the poverty rate and measure inequality is standard of living. In France, it is usually estimated on the basis of the Tax and Social Incomes Survey (ERFS).

Broadening Concept of Income and Redistribution. In parallel, several studies that chose to adopt a microeconomic approach, i.e. based on household data, have broadened

the concept of disposable income by including different types of public transfers. Amar *et al.* (2008) therefore add the public services of health, education and housing to the scope of monetary redistribution. This extension of the analytical framework for the redistribution of adjusted disposable income was a recent development at the time of its publication, although some studies had explored certain aspects of it previously. Hugounenq (1998) and the French Council for Employment, Income and Social Cohesion (CERC)² (2003) chose to concentrate on education.

Other studies focused more specifically on the redistributive effects of the public health system, following on from Caussat *et al.* (2005) and Marical (2007). The *Omar* model developed by DREES (Lardellier *et al.*) (2011), therefore not only allows for the study of the distribution of the cost burden according to standard of living, but also the redistributive effects of the health system. Several DREES studies document these effects in particular: Caussat *et al.*, (2005), Duval and Lardellier (2012), Jusot *et al.* (2016), Fouquet and Pollack (2022).

In addition, recent studies by Guillaud, Olckers and Zemmour (2019) and Amoureux, Guillaud and Zemmour (2019) contribute to this field of literature by proposing an analytical table to study the reduction of inequality brought about by tax and benefit systems. Based on the breakdown of household disposable income according to data from the LIS survey, which was conducted in 22 OECD countries between 1999 and 2016, these analyses measure the extent to which mandatory deductions and benefits in kind reduce inequality. By processing 80% of mandatory deductions and all of the cash transfers together, they highlight in particular the fact that the structure and level of taxation, as well as the form and volume of social security benefits, do not contribute to reducing inequality in the same way. Guillaud, Olckers and Zemmour (2019) demonstrate that the degree of social redistribution is overdetermined by the level of public transfers rather than the progressivity of taxes.

Amoureux, Guillaud and Zemmour (2018), and Ben Jelloul *et al.* (2019) reveal that social security contributions (SSC) are responsible for the squeezing of income at the bottom end of the distribution, while income tax is responsible for squeezing income in the top half of the distribution. Rather than progressive taxes and anti-redistributive social deductions, the authors observed complementarity between the two types of deductions.

Distributional Accounts by Category. In the meantime, many studies carried out within official statistics have sought to complement the microeconomic approach to monetary redistribution by breaking down the national accounts. Accardo (2019) and Accardo (2020) provide a historical overview of these for France. In the 1980s, INSEE published an annual income account for several dozen types of households based on its socio-demographic characteristics.

Accardo *et al.* (2009) proposed that household accounts be broken down by category for the year 2003 by combining the national accounting approach with the microeconomic statistics on inequality. This is linked to the working paper by Bellamy *et al.* (2009) and breaks down disposable income and consumption in the national accounts according to four socio-economic criteria: standard of living, household composition, age or socio-professional category of the reference person. This makes it possible to infer the saving rate for each of these various characteristics. This was the approach taken by Le Laidier

² This report was updated in 2011 in note no. 2497/DG75-F120 by Fabrice Langumier “La répartition des dépenses publiques de l’enseignement supérieur et des aides associées” [The distribution of public expenditure on higher education and associated assistance].

(2009) and, more recently, by Billot and Bourgeois (2019), with a view in particular to comparing the annual changes in the accounts for each household category and specifying the various concepts relating to the perception of household income. A breakdown of the wealth account by household category was also proposed for the year 2003 by Durier, Richet-Mastain, and Vanderschelden (2012). Accardo, Billot et Buron (2017) suggest breaking down the household accounts for 2011 according to standard of living, age, the socio-professional category of the reference person and household composition on the basis of 2010 accounting standards.

The microeconomic and macroeconomic coherence of distributional statistics was also pursued within the international statistical system, within the OECD *Expert Group on Disparities in National Accounts* (EG DNA). The group enhanced a set of simplified distributional accounts base on the notion of adjusted disposable income, adding in kind benefits such as education or health to usual disposable income. Still experimental, they may integrate, as satellite accounts, the next generation of Statistical National Accounts to be issued by UN Statistical Commission in 2023, following the recommendation of the ad-hoc working group tasked to make propositions to be submitted to member states. Other works were conducted in the same spirit, such as National Transfer Accounts by age, computed by a team led by H. Albis³ (see for instance, Albis and Moosa, 2015⁴).

Distributional National Accounts. In parallel to all of these studies, academic literature has made increasing use of comprehensive administrative data to complement survey data. This development began with the work of Piketty (2003) in France, and Piketty and Saez (2003) in the United States, which provided an update to the work by (1953) and Atkinson and Harrison (1978) in order to analyze the development of high incomes over the very long term. Their methodology has been extended to many countries by several researchers, whose studies have been collated in two works, edited by Atkinson and Piketty (2007; 2010). Those estimates were used as the basis for the *World Top Income Database* (WTID) in 2011. The WTID provided historical depth, made possible by the existence of tax sources dating back more than a hundred years in many countries and cover very high incomes, which surveys have difficulty in capturing.

The WTID became the *World Inequality Database* (WID) to indicate the extended scope of the database, and the first DINA (Distributional National Income) handbook was published in Alvaredo *et al.* (2016). That handbook stressed the need to combine the various sources in order to obtain satisfactory estimates. In September 2020, the most recent guide by Alvaredo *et al.* (2020) updated the recommendations regarding the DINA project methodology. The DINA project aims to measure the distribution of national income in its entirety, making use of income (before and after transfers) and wealth concepts that are harmonized and coherent with national accounting, while maintaining the focus on the top end of the distribution with the use of tax sources in addition to surveys and national accounts. The first DINA projects have been launched in France (Garbinti *et al.*, 2018) and in the United States by Piketty, Saez and Zucman (2018). In France Bozio *et al.* (2020) use DINA method to measure inequality before and after redistribution over the long term. Their work is based on administrative data so that they can be precise at the top of the distribution. Nonetheless, they lack precise data on in kind transfers and local public amenities so that they need to do assumptions on their distributions, where we found our results on micro-data.

³ <https://ntaccounts.org/web/nta/show/>

⁴ Generational Economics and the National Transfer Accounts. *Journal of Demographic Economics* 81, 409-441, 2015.

Similar studies are being carried out in several other countries in both the developed world and in emerging economies. The *World Inequality Lab* also produces inequality continental or world estimates of DINA methodology. The recent publication by Alvarado *et al.*, (2020) which appeared in the special edition of *Economics and Statistics* dedicated to national accounting provides a description of the method and summarizes the empirical findings.

While they are similarities between all these approaches, there also show significant methods, sources, and conceptual differences that necessitated be highlighted. For example, the notion of pre-tax income may or may not include pensions or unemployment benefits, imputed rents or retained earnings. Depending on whether those income components are included in the analysis, the conclusions regarding the level of inequality, the trend or the level of redistribution for a given country may vary widely. Facing those disparities, INSEE also brought its contribution to the harmonization effort by initiating a broad national expert group, bringing together key academic and government teams working on inequality. They issued a set of recommendations relative to the measure of inequality and redistribution, those including a comprehensive micro-founded method to effectively distribute the whole national accounts between households (See Germain, André and Blanchet 2021).

III. Methods and Data

In this section, we expose the method to distribute the entire national income. We start with some general principles and definitions and then present data and practical details. Redistribution measures are generally based on microeconomic data but only cover a part of income and transfers. Macroeconomic aggregates taken from national accounting are a way to construct the broadest scope and define a coherent and comprehensive measure of redistribution. The distributional accounting is a method to reconcile these two fields based on these two sources: on the one hand, there is national accounting data, which are summarized in a table of integrated economic accounts (TIEA), to which are added further outflows from national accounting and, on the other hand, there are various sources of information that micro-found the distribution of income and transfers

A. Principles of Distributional Accounts

Our goal is the distribution net national income among households grouped by categories, following the classical sequence of national income, starting from primary income, the accounting for redistribution to finally end to disposable income.

Net national income is itself related to GDP, which is the most commented on aggregate in national accounting, by subtracting to the latter fixed capital consumption (i.e. capital depreciation) and adding net income from the rest of the world (RoW), i.e. the income produced in France but held abroad must be subtracted and the income produced abroad but held in France. French GDP amounted to 2,426 billion euros in 2019, FCC to 450 billion euros and net income from the rest of the world to 50 billion euros resulting in a NNI of 2026 billion euros.

To insure comparability and national coherence, we propose a synthetic presentation of distributional account inspired from the “Table of Integrated Economic Accounts” (TIEA) of UN-Stats standardized norms for establishing National Accounts (SNA for System of National Accounts) and therefore named “Table of Integrated Distributional Accounts” (TIDA, see figure 1 above).

Both table describe flows of income received or paid by entities, between so-called “institutional sectors” for TIEA principally households, companies and public authorities; and, in the case of the TIDA between groups or categories of households. The TIEA is arranged in institutional sectors (S), non-financial corporations (S11), financial corporations (S12), public authorities (S13), households (S14) and non-profit institutions (S15). This necessitate to affect to households (S14) income or transfers belonging to the other institutional sectors (S11, S12 and S15) from the table of integrated economic accounts.

Both tables have similar lines, with primary income at the bottom, then secondary distribution after taxes, contribution and benefits in cash. This leads to the core notion of disposable income. The bottom of both table is dedicated to collective consumption, distributed to households in the form of public services.

Each of the rows in the TIEA is distributed among categories of household (see next section). The accounting operations can be repeated for various type of household category (fractile of income, age, diploma...). Since all income is allocated to households, and as all of the transfers paid balance all the transfers received, modulo the deficit, which is itself distributed (see above), there is accounting equality at the aggregate level of all households, the sum of NNIBT = the sum of NNIAT = NNI. The equality of NNIBT = NNIAT = NNI of course does not hold for each standard of living group, since these transfers take place between households, and it is by studying these very differences that the assessment of the redistribution of transfer systems emerges.

Figure 1: From the Table of Integrated Economic Accounts to a Table of Integrated Distributional Accounts

Table of integrated economic accounts							Table of integrated distributional accounts							
	Uses		Ressources			Net	Households							
	Companies	Households	Public auth.	Companies	Households	Public autho.	All inst. sectors	All households		Poor	Median	Middle	Up-Middle	Best-off
Production and Allocation of Primary Income Accounts							Primary Income = Income Before Transfers							
Labor, property and public								Labor, property and public						
Secondary Distribution of Income Account							Monetary redistribution							
Benefits in cash - taxes								Benefits in cash - taxes						
<i>Disposable income</i>							<i>Disposable income -> usual standard of living</i>							
Use of Income Account							Non monetary redistribution							
Collective consumption								Benefits from pub. services						
							Income After Transfer -> Extended Standard of Living							

Note: TIDA is here written by standard of living groups, other categories of households are possible.

B. Data Sources

We use two main sources in order to distribute national income: national account data, which are summarized in a table of integrated economic accounts (TIEA), and on the other hand, various sources of information that micro-found the distribution of income and transfers.

Macro. The TIEA used is from French national institute of statistics and based on the system of national accounts (SNA), the official international framework of conventions. Additional sources are derived from national accounting satellite accounts, and taken

from the initial sources used to establish the TIEA. In this paper, we also make use of the distribution operations identified in the SNA letter D (for example D1 for employee remuneration) and the rows referring to balances associated with the SNA letter B (such as B5n for NNI, which is equal to the balance of net primary income for the various sectors).

Micro. We use different dataset but mainly the Insee Tax and Social Revenue Survey (ERFS), which brings together socio-demographic information from the Labor Force Survey, administrative fiscal record of income declared to the tax authorities, and information from organizations in charge of distributing social benefits⁵. The ERFS is based on a sample of approximately 50,000 households, which is equivalent to 130,000 individuals and representative of the population living in ordinary housing in metropolitan France. The ERFS is INSEE's preferred source for the analysis of living standards, and is linked to INES microsimulation model (see below). The wealth of information included in the ERFS and especially from the Labor Force Survey allows us to: (i) micro simulate all the transfers very well with Ines model, and (ii) provide a breakdown of income and transfers according to many different variables.

Other databases are also used to complete ERFS and allow for the sound simulation of some transfers, namely:

(i) The INSEE Family Budget survey is used to impute the consumption data based on which the VAT paid by households is simulated in Ines. This survey has been carried out since 1979 on household consumption, with the objective being to measure not only the expenditure, but also the resources of households living in France (Metropolitan France and French overseas departments and territories) as accurately as possible. It covers all so-called "ordinary" households;

(ii) The INSEE Housing survey is used in Ines to impute rents, which are absent from the ERFS. The aim of the survey is to describe the housing conditions of households and their housing expenditure and therefore it contains rents and charges for tenants, together with a lot of other information;

(iii) In order to simulate the capital tax (*impôt sur la fortune* –ISF- and the *impôt sur la fortune immobilière* -IFI), it is necessary to have information on the wealth of individuals. To that end, we use matching based on the INSEE Household Wealth surveys. These surveys describe real-estate, financial and professional assets of households and their debt, based on a sample drawn from housing tax files or other fiscal sources. In order to better understand high wealth levels, we also use files specific to the ISF and the IFI, recently made available by the Directorate-General of Public Finance (DGFip) (Paquier *et al.*, 2019);

(iv) The Health Care and Insurance Survey (ESPS) (IRDES, DREES) to distribute health. This database provides a representative sample of households in ordinary housing in metropolitan France and contains socio-demographic information (income, health status and type of supplementary coverage). The survey is matched with administrative data regarding health insurance reimbursements (National Health Insurance Fund –CNAM-, National Health Data System –SNDS-), which provide expenditure presented for reimbursement and AMO reimbursements;

⁵ From the Caisse nationale des allocations familiales (National Family Allowance Fund –CNAF), the Caisse nationale de l'assurance vieillesse (National Old-Age Pension Fund –CNAV) and the Caisse centrale de la mutualité sociale agricole (Central Agricultural Social Mutual Fund –CCMSA) which provide the social benefits paid

- (v) The ENRJ (survey on youth income) survey by INSEE and DREES to know the income of student who are not cohabiting with their parent, to distribute education;
- (vi) The DADS database from (“Annual declaration of social data”) which gives the wage bill of the public employees to be able to distribute the collective public service.

C. Microsimulated Distribution of Income and Transfers

a. General methodology

The INES open-source⁶ microsimulation model draws upon ERFS data in order to micro simulate French social and fiscal legislation. This model simulates the majority of direct social and fiscal taxes, indirect social and fiscal taxes and social benefits. The first part of the model gather different data, impute some variable, recalibrate and age the data, and the second part simulate each transfer based on the legislative schedules (see Fredon and Sicsic, 2019 for more detail on the model).

The wealth of information included in the ERFS and especially from the Labor Force Survey makes it possible to finely simulate the social benefits, taxes and contributions that depend on many variables, which are not always present in fiscal sources alone: family profile, labour market history, employment status (public or private), number of hours worked, type of job and business, rents, place of residence, disability status, etc.

Thanks to its representativeness and the richness of the transfers that it is able to simulate, the INES model forms the basis for the exercise involving the distribution of national income and its components by stratum. Indeed, the information from ERFS makes it possible to produce analyses by dividing the population into different group, according to:

- **living standards.** All the income and transfers are distributed by ten or twenty groups of equal sizes according to their living standards that is its disposable income⁷ divided by an equivalent scale accounting for household size (number of consumption units⁸). We rank household from the poorest to the wealthiest, and this ranking remains unchanged in order to distribute income and transfers to households in these tenths of living standards. The sampling does not allow for accurate results beyond the twentieth in the case of variables with a continuous basis, such as income or wealth. By exception, we will provided some results for the top 1% and only for data robust enough such as primary incomes or taxes, levies and contributions⁹;
- **income “social” group**, that is the usual poor category with equalized income of 60% of median income or less, but also for other categories: modest (income between 60 and 90% of median income), median (90 to 120%), upper middle (120 to 180%) and better-off (180%). For France, the two first category represent

6 See <https://adullact.net/projects/ines-libre> for the source code, and detailed documentation of the model, including in particular deviations from external targets, in terms of both the number of households affected and the total transfers simulated.

⁷ Declared income net of social security contributions, plus benefits and less direct deductions

⁸ Consumption units are generally calculated according to the so-called modified OECD equivalence scale which assigns 1 CU to the first adult in the household, 0.5 CU to other persons aged 14 or over and 0.3 CU to children aged under 14 years old.

⁹ The concentration of which is very high in the uppermost bands: the estimated effect at the extremes is less robust than those estimated for each tenth and the sample size does not allow for more detail, such as per hundredth for example, unlike exhaustive sources.

around 40% of the population and are often design in the literature as popular household. The median and upper-middle represent around 50% and could be seen as composition middle class, and our better-off group close is close to the usual top 10%. We will use in this paper the acronym P3MB (for Poor/Modest/Median/upper-Middle/Better-off) to design the related distributional accounts;

- **diploma** of the person of reference of the household, in 5 group: no diploma, vocational diploma, baccalaureate, bac+2 degree, bachelor and more;
- **employment status** of the person of reference of the household, in 5 group: employed, unemployed, retired, self-employed;
- **age** of the person of reference of the household, in five groups: 18-29; 30-39, 40-49, 50-64 and 65 or more;
- **localisation of the household**, in five groups: “rural” areas, “small towns” that is county of less than 20,000 people, mid-sized cities (20,000-200,000), “larger cities” (urban area of 200,000 or more inhabitants) and “Greater Paris”.
- **family configuration**, in five groups: single people, couple without children, couple with one or two children, couple with more than three children, single parent. We also distinguish the sex of the parent for single parent for gender studies.

We also distribute by age cross diploma for life cycle computation, thus having 25 breakdowns; and for detail life cycle computation, use five years grouping starting from 25 or less and going to 75 or more.

Note that to distribute transfers, it is necessary to make tax incidence assumptions. Following Saez and Zucman (2019), we impute *taxes to the factor on which the amount of the tax depends*. Although employers’ contributions are nominally paid by employers, the amount depends on the company’s payroll. They are therefore allocated to the employees. Conversely, corporate tax depends on the profit of companies and is therefore paid on that profit.

A simple economic logic underlies this approach: if the aim is to model the decision of an agent with regard to the use of a resource (for the purposes of production or consumption), the only taxes that directly influence that decision are those that depend on the resource in question. Therefore, the analysis of the distribution of taxes provides data of relevance for the modelling of certain behaviors by agents, but does not comment on the behaviors themselves. They should be regarded as *ex-ante* measurements, without prejudging possible behavioral effects.

b. Distributing income before transfers

The distribution of income before transfers in the S14 (household) account is made up of three components.

Labor Income. The first part corresponds to the wage income of S14.D1, distributed according to the sum of gross wages (DNA.11, see annex for TIDA nomenclature and correspondence table with TIEA) and contributions (DNA.12). The information required in order to estimate the distribution can be found the INES model from ERFS data. The net salary is taken from tax returns, which are one of the sources for the ERFS data. The earnings variables are reported by employers and are especially reliable since they are controlled by the fiscal administration with frequent audits. Next, both employee and employer contributions (DNA.12) are finely simulated by the INES model using information available from the Labor Force Survey, another source used by the ERFS. They take account in particular of the characteristics involved in the calculation of

exemptions (public/private, hours worked, remuneration amount, etc.). All of the different rates for old age, sickness, family and unemployment benefit contributions are well integrated in the INES model.

Mixed and property income. The second part consists of net mixed income and wealth (DNA.2, namely the sum of the net mixed income of self-employed persons, including self-employed (DNA.2.1), net property income (DNA.2.2) and actual rents paid and imputed by owners net of depreciation (DNA.2.3). All of these types of income are present in the Ines model from ERFSS data and are recovered within INES in the same way as labor income (administrative tax sources matched to ERFSS households).

However, the capital income included in the ERFSS is the income which is taxed while some financial income are tax-exempt or only partially taxable and therefore not well-known from tax sources: these income are calculated in the ERFSS by applying rates of return to stocks of assets imputed to the households covered by the ERFSS on the basis of the Wealth Survey (Baclet & Raynaud, 2008). Moreover, a specific module for the production of the ERFSS allows for the estimation of imputed rents using regressions on the basis of actual rents (using imputation from the French housing survey) and dwelling characteristics (localization, number of rooms, type of dwelling, surface area, etc., from administrative data from local tax, matched with ERFSS data).

We have so far detailed the primary income that the national accounts attribute directly to the household sector. This income does not cover national income in its entirety: the remaining fraction is assigned to the public authorities, to companies and to non-profit corporations. The distribution of income in the public authorities' sector is broken down into two stages. These resources are calculated within the scope of the TIEA distribution operations, within rows DNA.3 and DNA.4.

Corporate Income and Retained Earnings (DNA.3). As other studies on DNA and according to our methodological rule (that is: *the factor that pays a tax is the one on which the amount of the tax depends, previous section*), corporate income is attributed to shareholders (since they are the ones who control the company and who benefit from the capital gains derived from this income). While distribution of corporate income is relatively simple, retained Earnings is more complicated. In an ideal world, it would be possible to link individuals' tax revenues with the accounts of the companies they own. However, it is not (yet) possible in France.¹⁰ Thus, in practice, retained earnings are therefore imputed in proportion to distributed profits, i.e. the dividends received by households in the ERFSS data of the INES model. Without making any claim that such an assumption is systematic at the individual level, it provides plausible distribution results. The main effect of this is that corporate ownership is highly concentrated, which results in these retained earnings making up a large share of the profits of the wealthiest people.

Tax on consumption and production (DNA.4.1). Following our incidence principle, taxes on products (VAT, domestic duty on consumption of energy products, excise duty) are allocated on the basis of consumption and are distributed with the indirect taxation module of the INES model (André, Biotteau and Duval (2016), André and Biotteau (2021)). The distribution is based on consumption data taken from INSEE's Family Budget Survey, which have been statistically matched to the ERFSS data). For taxes on production, we would systematically follow the convention. Tax on production such as household's property tax on built properties (*taxe foncière sur les propriétés bâties*) is distributed according to André and Meslin 2021; the distribution of production taxes or

¹⁰ A project close to that purpose is being conducted by IPP (Bozio et al., 2022).

subsidies based on wages is also micro-founded. Other production taxes adopt the normative profile factor income.

According to national accounting conventions, taxes on products and production are considered as primary income of public authorities. For taxes on production, we would systematically follow the convention. For product taxes, we take two alternative approaches. The first is to treat them like taxes on production and include them in income before transfers. We call this approach is called at “market prices”, meaning the national income before transfers includes all taxes on products. The advantage is to stick to national accounting statistics: the sum of individual incomes is equal to net national income. One drawback is to impute to households an income that they do not effectively receive, to then withdraw it from them in transfer operations. This is crucial to study of exhaustive redistribution. Nonetheless, this refers to an abstract situation of income that would be received in the absence of transfers.

The other approach consists of considering, as income before transfers, only primary factor income, which is actually received by households or the businesses they hold, and the taxes on production that our method allocates in proportion to the income of factors, (with the exception fore-mentioned). Taxes on products are taken into account in redistribution operations, but by subtracting them from income after transfers, and not the before transfers primary income. We will then speak of income “at production prices” or the purchasing power of income. The disadvantage of this second way of proceeding is that by deducting taxes on products before they are consumed, we move away from the notion of net income actually received by households after redistribution operations.

The primary revenues of public authorities derived from levies on production appear a second time in TIDA (DNA.5.2), in secondary distribution transactions as taxes paid by households or the businesses they own. The same applies, where applicable, to taxes on products (DNA.5.1), according to the standard used for primary income (see above).

Other primary income (DNA.4.2). According to National Accounts rules, other component making up the primary income of the public authorities is property income of the public authorities. This component is generally negative, as it includes the payment of interest on national debt. This component of primary income is distributed as the average between benefits and deductions, in line of Piketty, Saez, Zucman (2018). The idea here is that the deficits would be filled one day or another by a mixture of tax increases and spending cuts whose composition cannot be prejudged and therefore normatively based on a 50/50 repartition, and without modification of the structure within the transfers received as paid. It can either be separated or distributed since identified with a specific TIDA line. Given the amounts involved, the impact of any particular assumption is small.

c. **Distributing secondary income**

Tax on income and wealth (DNA.6). They correspond to the D5 accounts of the TIEA for institutional sectors S11+S12+S14. Composed primarily of the Generalized Social Contribution (DNA.6.1), income tax (DNA.6.2) and housing tax (DNA.6.4), these deductions are distributed on the basis of the INES model and in accordance with the general logic of the table. Household income tax (D.6.2) is simulated within the INES model on the basis of the tax cells present in the ERFS, which are derived from administrative data.¹¹ The majority of tax credits and reductions are simulated in this way.

¹¹ For 2018, if we compare the total tax paid by ordinary households in metropolitan France, as simulated by INES, with that obtained from the fiscal data (corrected to create coverage equivalent to that of the ERFS), it turns out that

The same is true of the Generalized Social Contribution and other social security tax [*prélèvements sociaux*, DNA6.1 and DNA6.6].¹² Housing tax (DNA6.4) is not simulated, but is present within the ERFS data during matching with the tax data. As for tax on wealth (ISF, D6.5), there is no database that provides us with all of the components used to calculate both standards of living and the capital tax among the same sample of households. We use the work of Paquier *et al.* (2019) who impute, within the ERFS, the amounts of different types of wealth held by households. This imputation was performed by combining several methodological approaches and several sources of data (INSEE's wealth survey and the wealth tax data provided by fiscal administration) in order to assign the most precise possible wealth amounts to the households in the ERFS.¹³ According to the incidence principles (previous section), corporate income tax (DNA.6.3) is paid by all holders of capital, regardless of whether that holding is in the form of shares or bonds. Indeed, corporate tax is distributed in the same way as retained earnings in the absence of reconciliation between the data at the level of households and companies (see below).

Social Security Contribution (DNA.7). SSC correspond to account D61 in the TIEA for institutional sector S14. Their distribution also follows the overall logic of the table. As a result, pension contributions (DNA.7.1), sickness contributions (DNA.7.2), family contributions (DNA.7.3) and unemployment contributions (DNA.7.4) are based on the distribution obtained by the INES model thanks to the richness of the Labor Force Survey variables and, in particular, the reconstitution of an infra-annual employment calendar. They take account in particular of the characteristics involved in the calculation of exemptions (public/private, hours worked, remuneration amount, etc.). All of the different rates for old age, sickness, family and unemployment benefit contributions are well integrated in the INES model.

Monetary Benefits in Cash and Allowances (DNA.8). Likewise, the transfers of S14, D62 (DNA.8.1 to DNA.8.6) are obtained thanks to the INES model: retirement pensions, unemployment benefits, family benefits¹⁴, minimum social security benefits¹⁵, in-work benefit ("*Prime d'activité*"), personal housing benefits (APL, ALS...), and disability pensions. Deferred income from pensions, unemployment benefits and disability benefits is declared income, upstream of the INES model. This is not simulated, but obtained from the ERFS databases. Conversely, family benefits and minimum social security benefits are simulated on the basis of the socio-demographic characteristics, incomes and social

INES very slightly underestimates taxes (the difference is -1% for 2018).

12 This difference remains the same, regardless of whether or not the various flat-rate levies on capital income are included in the totals being compared. When including the flat-rate levies, the total simulated by INES for 2018 is 70.8 billion euros, compared with 71.2 billion according to the DGFIP data. If we exclude these levies, the total simulated by INES is 67.3 billion euros, compared with 68.2 billion according to the DGFIP data.

13 The imputation method used ensures good correlation between wealth on the one hand and standard of living and the socio-demographic variables of the ERFS on the other hand. In addition, it ensures that the findings are consistent with fiscal data. On the basis of the imputed wealth, an amount of wealth taxable under the ISF is deducted by applying the various deductions, and a tax on wealth is simulated by applying the legislation and taking account in particular of the discount, reductions and cap. This imputation allows INES to create a very precise simulation of the Tax on capital paid by households (Paquier *et al.*, 2019).

14 *i.e.* family benefits, family support allowance, educational allowance for disabled children, prime de naissance (a benefit following the birth of a child) and allocation de base de la *prestation d'accueil du jeune enfant* (an early childhood benefit), *complément familial* (a benefit for families with 3 or more dependent children), *allocation de rentrée scolaire* (a benefit for education expenses) and *complément libre choix d'activité* (a benefit to offset the cost of working less due to childcare).

15 *i.e.* *revenu de solidarité active* (a statutory minimum income), *allocation de l'adulte handicapé* (a benefit for disabled adults), *allocation supplémentaire d'invalidité* (a supplementary disability benefit), *allocation de solidarité aux personnes âgées* (a solidarity benefit for the elderly), *allocation de solidarité spécifique* (an additional unemployment benefit). It includes also the *garantie jeune* (a benefit for NEETs aged 16 to 25) since 2017. For some of these benefits, non-take-up is taken into account.

scales within the legislation. They could be read out directly from the ERFs database, but the INES model simulations appear to more closely match the aggregate accounting amounts. Pending further calculations, daily allowances and compensation for accidents at work (CND.8.6) are distributed in the same way as other benefits. The reimbursements paid by additional organizations are distributed to them using the INES-OMAR model.

d. Distributing tertiary income

Health (DNA.10.1). The distribution of health expenditure presents a significant challenge, due to the high level of reimbursement expenditure (around 9% of NNI) as well as the degree to which health care systems are public depending on the country in question. The French Health Insurance System is divided between compulsory health insurance (AMO, 78% of consumption of medical care and products (CBSM)) and supplementary health insurance (AMC, 13.4% of CBSM). Contributions for compulsory health insurance are based on income, while the rate of reimbursement differs according to the type of care or patient. In addition, assistance such as supplementary universal healthcare coverage (CMUC) and supplementary health insurance (ACS) are aimed at the poorest households.

The INES-OMAR model allows health expenditure to be broken down and finely distributed to households. Developed and maintained by DREES, it is based on the ESPS survey, matched with administrative data regarding health insurance reimbursements. The model is based on the survey regarding the most popular contracts with supplementary health insurance organizations (DREES), which provides cover broken down by type of care, as well as the amount of the premiums and the number of beneficiaries.

This provisional version of the INES-OMAR 2017 model is primarily based on the 2017 Statistics on Income and Living Conditions (SILC), a representative sample of households in ordinary housing in metropolitan France, which contains a great deal of socio-demographic information, including income and type of supplementary cover. Health expenditure is imputed on the basis of the ESPS-EHIS 2014 matched to the SNDS and covers the scope of individualizable services presented for reimbursement in the community and in healthcare establishments, excluding welfare. The premiums and reimbursements for supplementary insurance are taken from the survey of the most popular contracts taken out with supplementary insurers in 2016. This allows AMO expenditure and contributions and reimbursements from supplementary health care organizations, to be distributed according to standard of living or other variables.

Education (DNA.10.2). The other main type of individualizable transfers in kind is education expenditure (5% of NNI). The general principle applied for the distribution of educational expenditure is to establish an educational benefit for each child within a household, the value of which is linked to the level and nature of the education they are receiving. Thanks to the Labor Force Survey matched in the ERFs, we know the educational training of each person above 14 years old. This makes it possible to distinguish between general and technological high schools, vocational high schools, higher technician sections (STS), preparatory classes for the *grandes écoles* (CPGE) and the university. Under the age of 14, we use children's ages to impute education (between kindergarten, primary, secondary). This involves using data on pupil and student numbers that are considered homogeneous in terms of educational costs and then multiplying them by the average costs found in the education accounts. Two types of calculation are made, one for primary and secondary schooling and the other for higher education.

As regards primary and secondary education, the training of the child, age and number of children in the ERFS data is used to assign a per-child cost to each household where applicable (taking the average cost per level – primary and secondary – according to the education account). This then allows costs to be distributed by standard of living tenth by aggregating the data for all households in each band.

Two different situations exist for students.

If they are cohabiting (i.e. living in the same household as their parents), higher education expenditure (with distinction between higher technician sections (STS), preparatory classes for the *grandes écoles* and the university) is allocated to the household to which they belong;

If they are not cohabiting, the usual scope of monetary redistribution excludes households in which the reference person is a student. Furthermore, the studies carried out on the basis of the ENRJ survey by INSEE and DREES have shown that it is inappropriate to consider them as separate households in their own right. They would then be considered as having no income, even though they receive private transfers and are mainly from the wealthiest households. Therefore, the population of non-cohabiting students, and therefore the related expenditure, is distributed by standard of living tenth, as per the ENRJ survey.

Social Welfare and Other Cultural and Associative Activities (DNA.10.3 and 10.4).

These two entries in account D63 are less important and represent €63 billion (3% of NNI) and €38 billion (2% of NNI), respectively. The first, which includes in particular the care package received in retirement homes or long-term care units, the childcare supplement (CMG) and non-profit medico-social accommodation is therefore distributed as a weighted average between the transfers simulated by INES in the absence of additional data, and the missing amounts are distributed as family benefits (with a redistributive profile). Non-profit cultural and associative activities, which include in particular sporting, creative, artistic and performing arts activities, are uniformly distributed because of lack of data and they are supposed to be universally accessible (i.e. 10% for each tenth).

Housing (DNA.10.5). The final type of individualizable social transfers in kind is housing expenditure (€16 billion, 1% of NNI). This relates to housing allowances paid to households that are renting their property and are dependent on household income, geographical area and partly on the cost of the rent. The amounts of the allowances are simulated in the INES model based on information present in the ERFS. Like the principle adopted for the other transfers in the table, accounting expenditure is distributed according to the simulated profile, which is heavily concentrated on the first standard of living tenths.

Collective Consumption Expenditure (DNA.11). The collective consumption expenditure are defense, police, justice and general operations of the government and local authorities. The distribution of this expenditure raises more conceptual issues than that of individualizable consumption expenditure. Two polar normative assumptions are used in the literature: flat-rate distribution or distribution in proportion to income.¹⁶ We

¹⁶ Flat rate distribution suggests that each individual benefit equally from collective consumption expenditure: it therefore has a strong equalizing effect on the distribution of income after transfers. Conversely, proportional distribution considers public goods to be neutral from the point of view of distribution. The latter approach can be interpreted as a service rendered in proportion to income. Taking this logic further, a specific approach for certain items of expenditure, such as for the national policing budget, one of the missions of which is to protect property, would consist of distributing them in proportion to the value of that property, i.e. to the wealth. That would have the effect of

distribute collective consumption expenditures of national attribution (such as defense, foreign affairs and the civil service of general government) on a lump-sum basis because they are supposed to benefit everyone. But for other collective consumption expenditures, known as "localizable" expenditures, we explore another option, using micro founded method to value public services according to their geographical accessibility. This innovation helps us to disentangle which assumptions is data driven. The territorial distribution of specific public services can be used for this purpose. Indeed, these part of collective consumptions are distributed on the basis of the wage bill of the public employees concerned (excluding hospitals and education because these are in kind transfers). From the administrative database named "Annual declaration of social data", public services are localized for each living area of each household. The ratio between the wage bill of these aggregated civil servants and the number of inhabitants in each catchment area is assigned to each household in the ERFS in order to measure collective expenditure in its area. In the Paris region, this zoning is too large to estimate the distribution of collective spending, so a more restricted breakdown was used, that of urban catchment areas [Caenen et al., 2016]. For robustness purposes, variants of geographic zonings were tested, the results are not significantly modified: the U-shaped profile is thus unchanged, and it is all the more marked the finer the breakdown. More generally, alternative hypotheses on the distribution of transfers were tested, but this did not alter the main conclusions.

IV. Market Inequality and Redistribution by Income Group

We begin here by studying income inequality and redistribution according to the standard of living. Households are grouped here by twentieth of increasing standard of living. We successively examine the distribution of primary incomes, then successively the redistribution effected by taxes, by social benefits in cash, or in kind, before taking stock of these transfers and drawing some lessons from them with regard to our initial questioning.

A. Before transfers inequalities: one third of households above the average

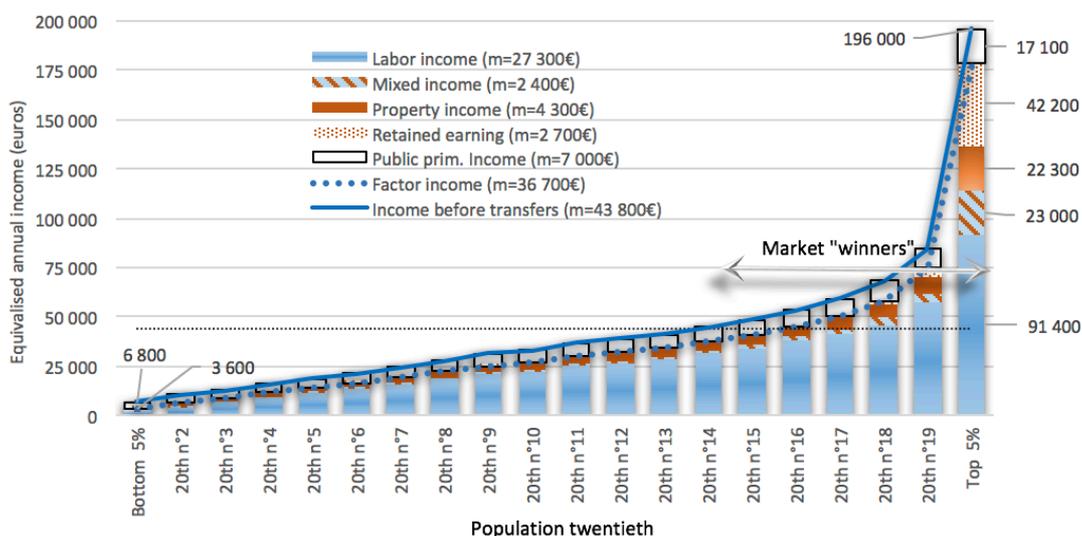
Income before transfers (also called alternatively in this paper for ease of reading "market income") are similar to the "pre-tax" revenue of the DINA research groups. One main difference is that we use equivalized measure in order to take into account children in the size of the household. This is the distribution of net national income to different groups of households. In our estimation for France in 2019, it goes from 6 800 euros for the 5% poorest to €196,000 for the 5% better-off, thus a 1 to 29 for ratio (Figure 2). The 1% richest receive from market €430,000 euros per equivalized capita.

Property incomes are concentrated on the richest: including mixed income: almost half (46%) are received by the 5% best-off. For them, they represent 50% of factor income – and even 65% for the 1% richest-, compared to an average of 25%. Retained earnings are important to correctly measure income at the very bottom of the distribution: supposedly distributed as dividends, they are mainly concentrated on the 1% richest, even more than

making such expenditure anti-redistributive. This goes beyond the scope of a distributional accounting exercise without substantially changing its overall results.

conventional property income (€147,900 euros compared to €53,100 euros of property income, €59,200 euros of mixed income and €138,100 euros of wages).

Figure 2: income before transfers by twentieth of income (France, 2019)



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

B. Redistribution: 60% of net beneficiary

On a macro prospect, transfers are aggregated by twentieth, counted positively if received by households and negatively if paid by them. In the end, the average net contributors are at the highest third of the scale of standards of living (figure 3). In this prospect, two third of the household appear net beneficiary of extended redistribution¹⁷, while only a third are beneficiary from the monetary redistribution¹⁸ (figure 2).

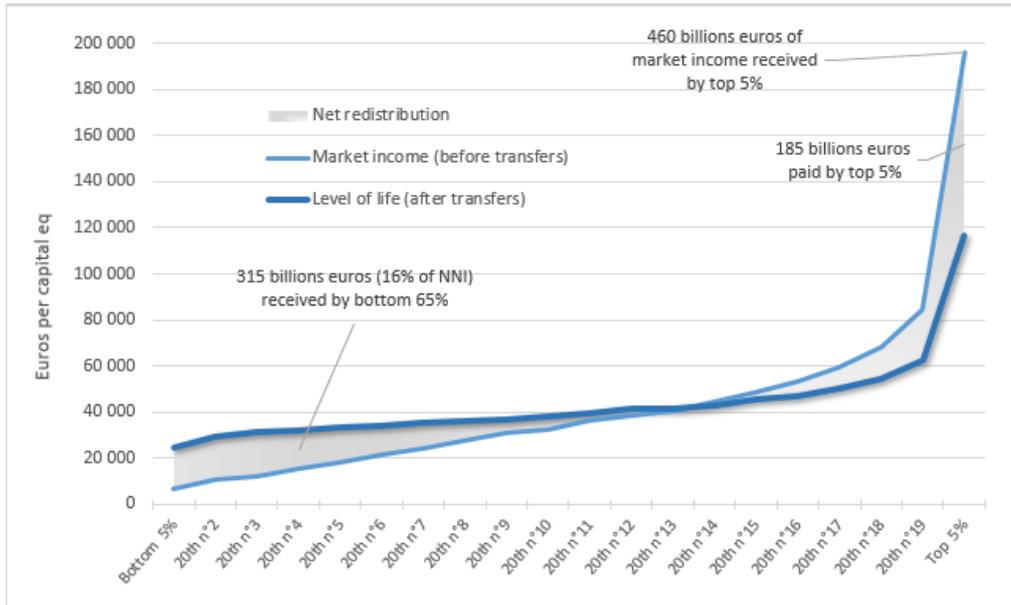
The net contributors of extended redistribution pay a net total of 315 billion euros to the net receivers, hence 16% of net national income is moved by public transfers on this macro net prospect¹⁹. The 5% richest get 460 billion euros from market (23% of net national income) and contribute to 185 billion euros to national solidarity (40% of market income). To obtain all twentieth of income be equal, the net redistribution would be of 580 billion euros; thus, actual redistribution can be considered as representing 54% of the maximum distributable.

17 Indeed, twentieth P6065 is net beneficiary (the overall taxes line curves is under the upper red line curves of all benefits), while twentieth P6570 is net contributor.

18 The crossing of the dotted tax curves (taxes on income and wealth only) and benefits from poverty, family, and housing shows that the 1/3 of individuals are beneficiaries.

19 Calculation based on twentieth.

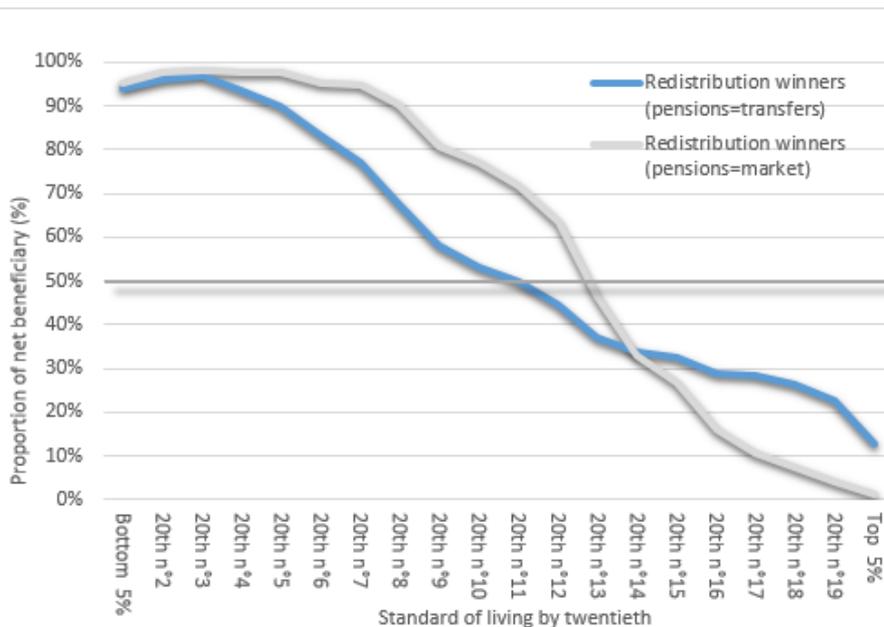
Figure 3: Income before and after transfers by standard of living level (2019, France)



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

One limit of this macro interpretation is that household can be looser from redistribution within a twentieth of income (e.g. no child, lack of public services in the neighborhood, not eligible to social housing, etc.). The microdata approach avoids this pitfall by showing the proportion of winners and losers within each standards of living groups (figure 4). A large proportion of poor and modest people are net beneficiary of redistribution, the rate of winners falls to less than 50% for middle and upper middle class households (45% for twentieth P6065 for instance). On the contrary, 17% of the 5% richest are net beneficiary once including pensions within redistribution. All in all, the proportion of net beneficiary is of 55% when considering pensions as part of redistribution and above 60% excluding them.

Figure 4: percentage of net beneficiary from redistribution by standard of living



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

This expanded approach of the redistribution show a much wider impact of public transfers than the usual approach. When accounting only for income and wealth taxes, and for monetary transfers (poverty, housing, family, disabled allocation), the balance between winners and loser appeared to be of less than 40%. This gives a possible explanation such as yellow vest protest or other anti-tax demonstrations (see section below).

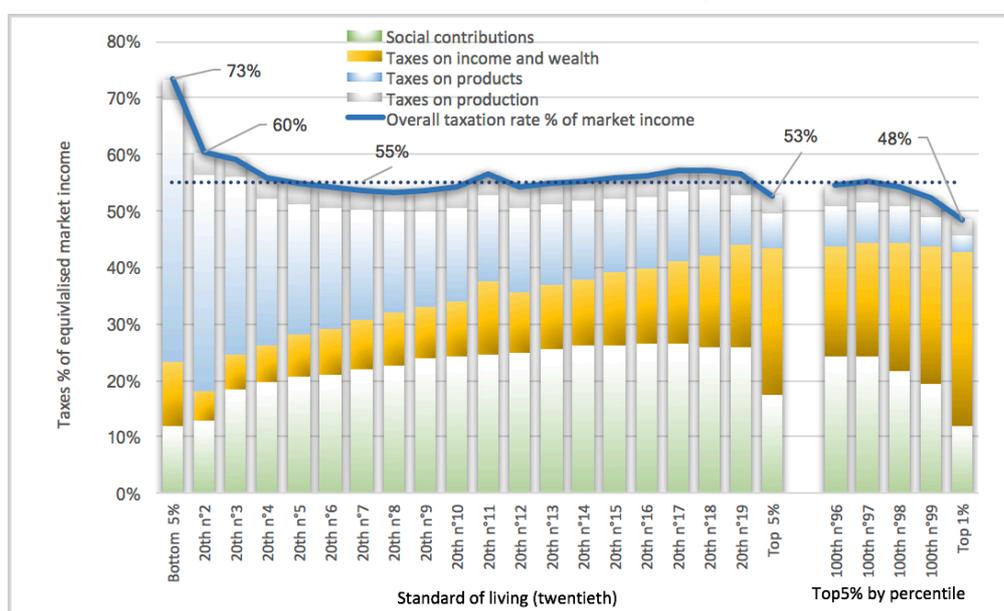
C. Taxes and SSC: no progressivity and even regressive extremities

Taxes on income and wealth are clearly progressive from a rate of 7,5% for the 10% poorest to 26% for the top 5% with an average of 15%. But this is more than counterbalanced by taxes on products (VAT, taxes on alcohol, tobacco or gas) which are particularly heavy on the bottom of the distribution. They represent 46% of income before transfers of the 5% poorest, compared to only 6% for the 5% worse-off.

All in all, as shown in the Figure 5, the shape of French tax system is regressive from first to fifth twentieth, then flat around its average of 55%; it then goes down at the very end of the distribution at 53% for the 5% richest and 48% for the 1% richest, mainly due to the fall of SSC.

The fall in SSC is mainly due to two main compositional effects. First, the share of labor income decrease for top income and is replaced by capital income which is less taxed. Second, individuals at the bottom of the distribution are older and then receive more retirement pensions which are excluded to SSC²⁰. The decrease of tax share at the top is consistent with other studies such as Garbinti et al. (2018) and could be more important with a more granular decomposition at the very bottom of the distribution.

Figure 5: overall fiscal rate by twentieth of standard of living (% of market income)



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations.

²⁰ These results take into account two second-order mechanisms which can act in opposite directions on the distributive profile of contributions: on the one hand, exemptions on low wages play a progressive role and on the other hand, the capping of these contributions can accentuate the regressivity for the highest incomes (cf. André 2022).

One third effect explains this regressive profile at the extremities, because of the lower capacity to save, poorest individuals face annual negative savings rate. Furthermore, richest show really high savings rate. These savings could lead to intertemporal consumption and then future taxation. So that, our measure of the progressivity does not take into account the dynamic effects such as savings, pluri-annual consumption or the level of wealth.

This result is obtained adopting what could be called a “production” approach. Taxes, duties and SSC are related to market income, regardless of their actual base. A second approach could relate taxes and SSC to total disposable income, including labor income, capital income and all kind of transfers received in cash.

They correspond to the two polar orderings of redistribution operations: in the first case taxes are levied (as is indeed the case for contributions and levies on production and products) and then redistributed. According to this logic, deductions should be related to primary income. In the other approach, pensions and other in cash allowances are distributed and then financed by taxes (logic of income tax which includes -sometimes at a reduced rate- the benefits received).

When all incomes are included, certain taxes are necessarily related to a tax base that is far from theirs. Reporting to disposable income is a minimal bound to report taxes because progressive income taxes have already been applied and poor-targeted social transfers already paid. Disposable income is then less unequal than primary income so that progressivity is easier to accomplish with a flatter denominator. Strictly speaking, progressivity of each tax should be regarded as the exact tax base but this restricts the global comparison we aim.

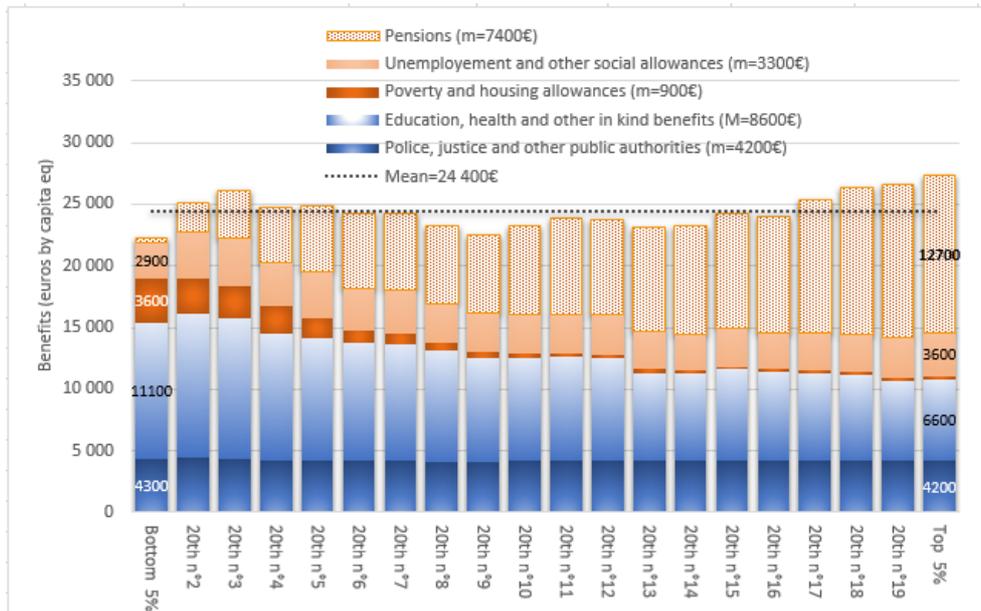
In both cases, we obtain an "inverted tilde" curve. In the second approach, taxes represent 57% of total income before taxes; the rate falls until 4th twentieth. Then the curve recover a slight progressivity from 42% to 53% at 18th twentieth. The slight regression at the top is weaker and is really seen at the very top (50% for top 1%).

D. Benefits received: in kind benefits and pensions play a key role

Monetary social transfers such as poverty and housing allowances, play an important role for poor people in the reduction of poverty, representing for example €3,600 per capita equalized for the 5% poorest, figure to be compared to the €3,600 euros they receive from the factor income (Figure 6). Because they are targeted on the poorest, they are decreasing very sharply as the income rises, concerning significantly people until the first third of the standards of living scale. All in all, they only represent an average of €900 per capita eq.

Family, disabled and unemployment allowances, cumulated, concern all households with an average of €3,300 per capita equalized (referred by simplicity as per capita eq), ranging from €2,900 to €3,900 (20th n°3). As differed income for older people, pensions show a growing shape topping at €12,700 per capita eq for top 5% households. For all households above median income, they represent from far the first source of public monetary transfers.

Figure 6: public transfers by twentieth of standard of living



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations.

On the contrary, valuation of social transfers in kind goes from €11,100 for the bottom 5% households, to 6,600 at the other end of the ladder. Non individualizable public services show a quasi-lump-sum profile: they represent an average of €4,200 per capita eq, within a €4,100-4,400 bracket. All in all, the profile of transfers received, in cash of kind, display no strong correlation with income and is roughly flat at around €24,400 per capita eq.

E. All in all, education, health main drivers of redistribution

To decompose the effect of the distribution and redistribution of income on inequalities, we first use the Gini index (see Table 1 and graphical representation Figure 7). The additive property of the Gini inequality index offers the possibility to track the origin of inequality formation and reduction (see Kakwani). To avoid re-ranking effects, Gini are computed keeping constant the order of the household. We choose standard of living as the ranking criterion to compute these pseudo-Gini. By doing so, we ensure that our pseudo-Gini for the standard of living is equal to the usual Gini value.

On a scale from 0 -no inequality- to one -all income detained by a single individual-, market inequalities are of 41.6% (pseudo Gini = 0.393). They are due for 60% to labor income inequalities (Table 1). Capital and mixed income account for 31%, addition of 18% of property and mixed income and 13% from retained earnings. Capital income inequalities are higher: top 5% receive 24 times more property income than the poor's (bottom 15%), and 532 times more retained earnings, compared to a 1 to 15 ratio for wages.

Table 1: Kakwani decomposition of inequality formation and attenuation (France, 2019)

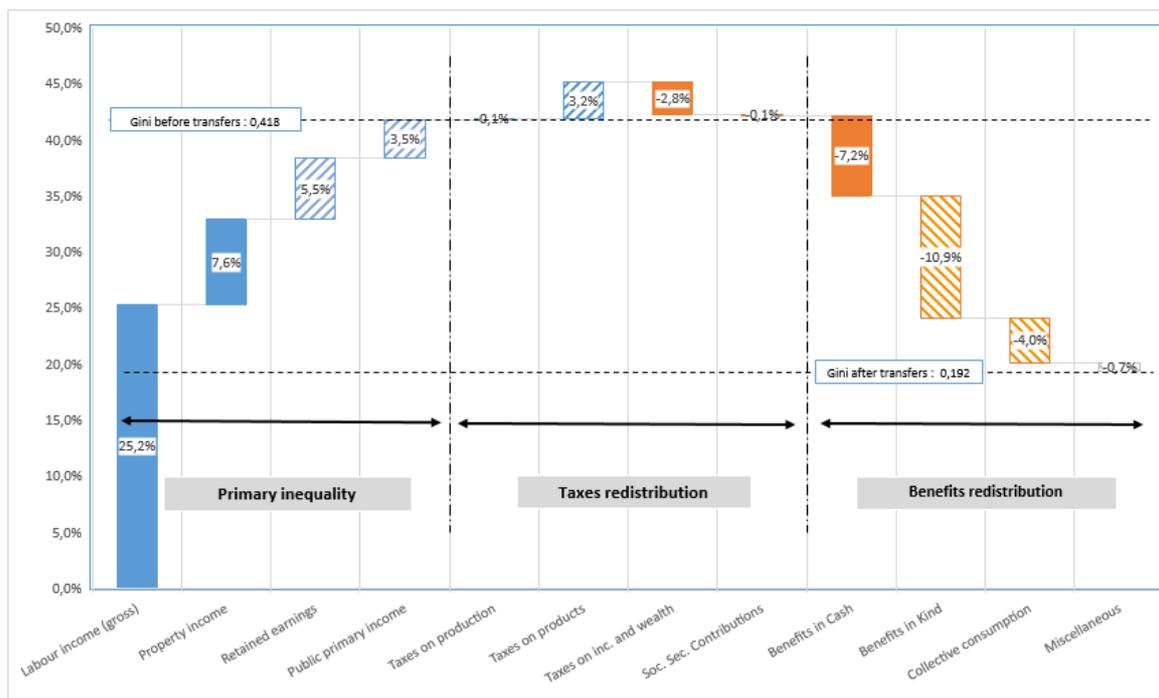
	€ per capita equivalized	Inequality and decomposition*	Contribution
Labor income	27 300	0,252	60,6%
Property income	6 800	0,076	18,3%
Retained earnings	2 700	0,055	13,2%
Public primary income	7 000	0,035	8,3%
Market income	43 800	0,416	100,0%
Taxes on products	-5 800	0,032	14,4%
Taxes on production	-1 600	0,001	0,3%
Taxes on income and wealth	-6 800	-0,028	-12,7%
Soc. Sec. Contributions	-10 100	-0,001	-0,3%
Benefits in Cash	11 200	-0,072	-31,9%
Benefits in Kind	9 000	-0,109	-48,7%
Collective consumption	4 200	-0,040	-17,7%
Miscellaneous	-100	-0,008	-3,5%
Extended Standard of Living	43 800	0,192	100,0%
Usual Standard of Living	27 500	0,284	
Overall redistribution		-0,224	0,0%
Taxes		0,005	1,7%
Benefits		-0,220	-98,2%
Health System		-0,044	19,5%
Pension System		-0,031	13,9%
Education System		-0,028	12,6%
Housing Subsidies		-0,013	6,0%
Poverty Subsidies		-0,012	5,3%

Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

In terms of pseudo Gini index, public transfers reduce market inequalities by more the half. Indeed, extended standard of living is of 19.2% (pseudo-Gini = 0,192). The main drivers of inequality reduction are in kind benefits (49% of overall inequality attenuation) followed by benefits in cash (32% of inequality reduction). The tax system is not redistributive in it-self. The progressivity of taxes on income and wealth contribute to lower inequality by 13%, but taxes on products have the opposite effects with a 14% contribution to increase market inequality, due to decreasing consumption rate with market income.

SSC shape is quasi neutral on inequality measured by Gini index. If we look deeper in the decomposition, health system appears to be the first contributor to inequality reduction, accounting by itself to 19% market inequality attenuation, followed by education system (13%), pension system (11%), poverty (6%) and housing allocation (5%).

Figure 7 : simplified representation of inequality formation and attenuation



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations. This new representation of Gini decomposition is a graphical for the Kakwani decomposition (table 1).

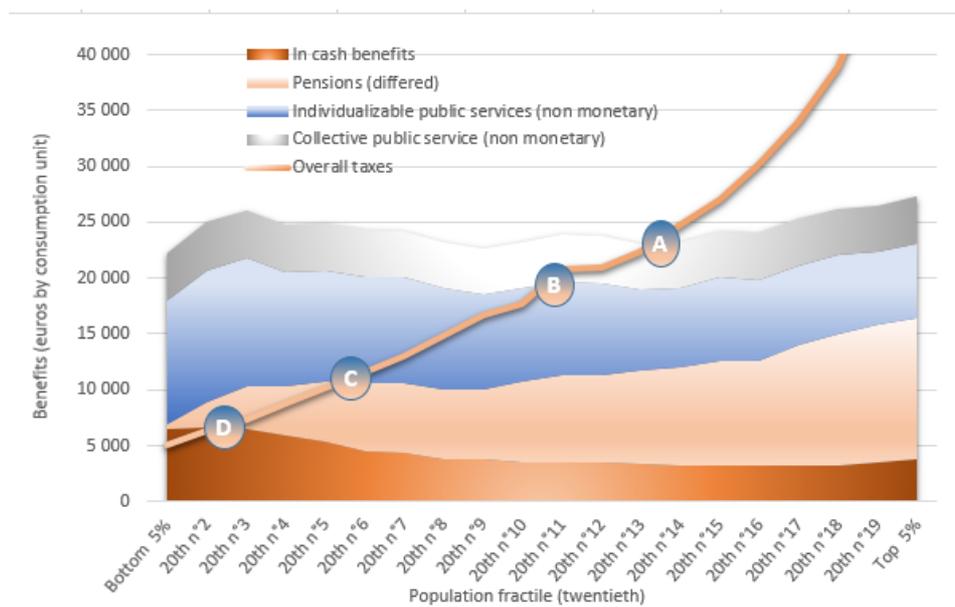
F. A possible explanation of yellow vest protest?

Our study of redistribution leads to paradox to which our evaluations lead 60% French people are net beneficiaries of the extended redistribution but with a feeling of "not getting what you pay for", that is to say a fair return of the taxes paid. Perfectly informed citizens should approve their tax and social system by two-thirds, which does not seem to be the case²¹.

The analysis of individual situations provides the beginning of an explanation: even within a stratum of standard of living, the perception can be very different depending on whether one has children or not, or depending on whether one is active or retired. And indeed, the average portion of individuals net beneficiaries of the redistribution falls from close to 2/3 at the aggregate level to 60% at the individual level, if one sums all micro net effects of the redistribution; thus, for example, the 5% just above the poorest 35% (8th twentieth) are net beneficiaries up to 8500 euros per consumption unit on average, but 33% of the individuals in this group are net contributors to the redistribution.

²¹ See for example Ipsos Affair survey, "Les français et l'impôt", octobre 2013 were 74% of respondents claimed to pay contribute more than they benefit from the system :²¹)

Figure 8 : transfers received in cash or kind compared to taxes and SSC



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

The Figure 8 provides an explanation by examining tax offsets by nature: the first two categories include monetary offsets, current (in dark brown) or deferred (in light brown) i.e. retirement pensions; the next two are non-monetary and correspond to counterparties in kind that can be individualized such as health or education (in blue) or collective such as security or justice (in gray); in light brown corresponds to the total amount of taxes.

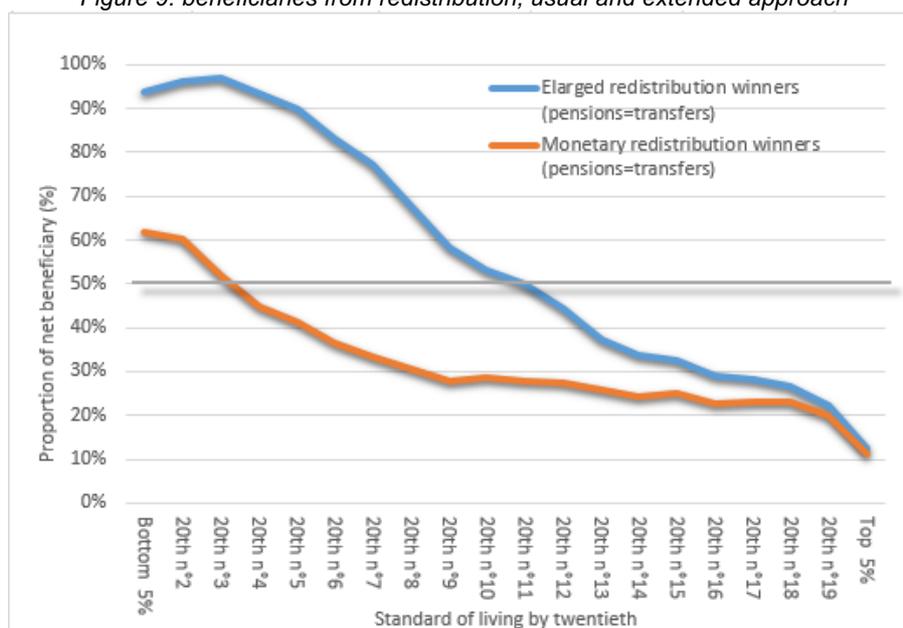
Households ranked below point A receive more, over their lifetime, and across income strata, than they pay in taxes. But if they think only in strictly monetary terms, the balance paid/received moves to point C; and if they think that they will never receive their pension, never at the expected level, they are even less likely to think that they receive more than they contribute (point D). If we continue the example of the 8th quartile, the counterpart of the €14,900 euros in taxes and contributions they pay is made up of €10,100 euros in cash (including €3,800 in social benefits and €6,300 in the form of retirement pensions), and €13,100 euros in kind (including €9,000 that can be individualized). Depending on the degree of confidence in the sustainability of social systems, and the degree of projection throughout life, the assessment that they can draw from their situation ranges from -€11,100 euros (3,800 – 14,900) to +€8,300 euros (23,100 – 14,900).

This discrepancy emerges from the comparison of net beneficiaries at the level of individuals, whether or not integrating non-monetary redistribution (see Figure 9 below). As we have seen, the number of net beneficiaries of the extended redistribution fluctuates between 56 and 60% depending on whether or not retirement is counted as a primary income. This figure drops to 32% if we compare all benefits received in cash (including pensions) with all taxes paid (including contributions and taxes on products and production paid). What is more, from the 4th standard of living quartile, there are fewer net beneficiaries in each household stratum than net contributors. In monetary terms, low-income and middle-class households can thus feel doubly harmed by the lower-than-average share of market income that is due to them, but also by a net contribution to

redistribution. It is only by giving monetary value to the public services they benefit that the situation is reversed from the point of view of redistribution.

Thus, even if people from the middle of the distribution are net winners of public redistribution, when they lose confidence in the pension regimes and see closing of public services such as hospital or education in their neighborhood, and in the meantime as sensualized to indirect taxes by sharp increase of gas price, they will have to feeling excessive fiscal burden relative to the benefits from their efforts.

Figure 9: beneficiaries from redistribution, usual and extended approach



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations

V. Inequality and Redistribution by age cohort

We have so far focused on inequalities and redistribution according to the standard of living. This provides a photograph at a given date, but does not provide information on life courses. Even if there is persistence, and especially in France, we do not systematically remain in the same income group, even with the relatively broad categories - poor, modest, median, upper middle and well-off that we defined in paragraph B above. The data on which distributional accounting is based do not make it possible to examine individual destinies in long term panel (the source data is rarely exhaustive). And the exhaustive databases do not have sufficient anteriority, nor the necessary statistical richness to carry out analyzes of the nature of the one above.

We can however approach the notion of inequalities and redistribution over the life cycle by establishing distributional accounts no longer grouping households by standard of living, but according to age, crossed with other categories more inherent to individuals. The notion of life cycle is therefore an ease of language, but it is indeed a pseudo life cycle that we are talking about.

This is the subject of the two following sections. Given the size of the sample of our data, we proceed in two stages: first an analysis with the unique criterion of age according to

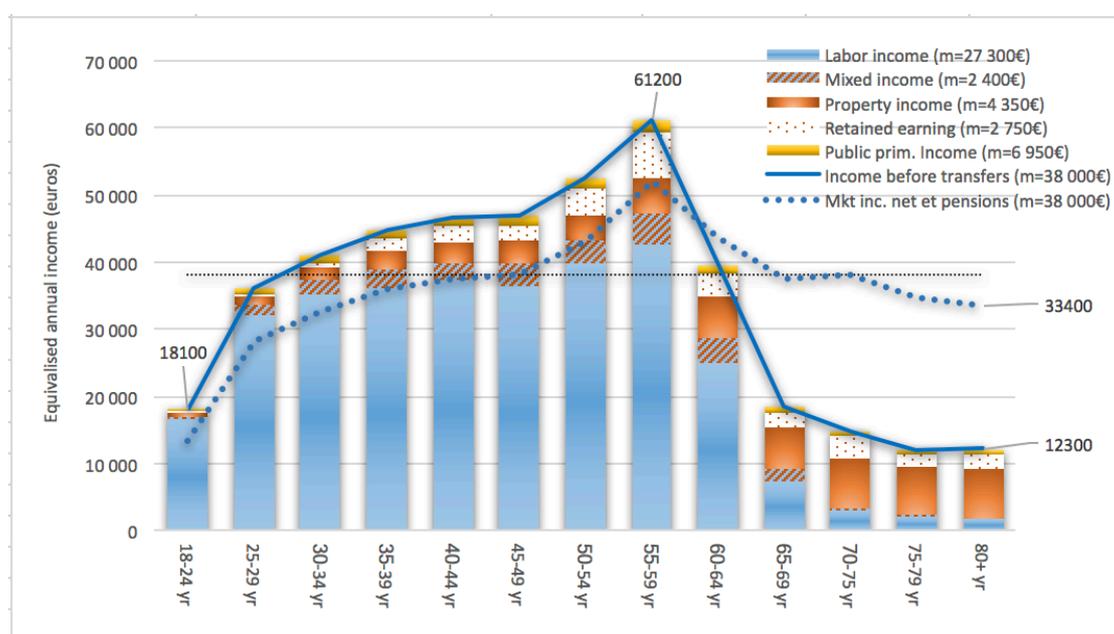
12 classes of the reference person of the household (the 18-25 years, plus slices age of 5 years and a category of 75 years and over); and secondly, five age categories crossed with five levels of diploma.

A. Primary incomes by age

We start by looking at primary incomes (figure 10 below). The profile of income before transfers is unsurprisingly very marked as a function of age, increasing until retirement age, then decreasing thereafter. If this evolution over the life cycle is natural, two categories clearly deviate: young people, whose incomes are falling sharply to the average income (€18,100 per consumption unit against €38,000 for the others); and the 50-60 who win higher primary income, mainly due to capital income (savings, but also inheritance of property assets and associated income, real or imputed for owners).

Market income is mainly composed of wages at the start of working life (92% for 18-25 year olds), then gives way more to capital income or mixed income. The latter account for 31% between 55 and 59 years old, 37% between 60 and 64 years old and then become the majority: 60% between 65 and 69 years old, 80% between 70 and 75 years old, 82% between 75 and 79 years old and 84 % beyond. A decline is also observed after age 65, which is however almost compensated when pensions are added to market income, thus considering them as deferred market income²². With this in mind, capital income peaks at 32% between ages 55 and 59 and then stabilizes slightly below 30%.

Figure 10 : primary equivalised income by age of household reference person



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

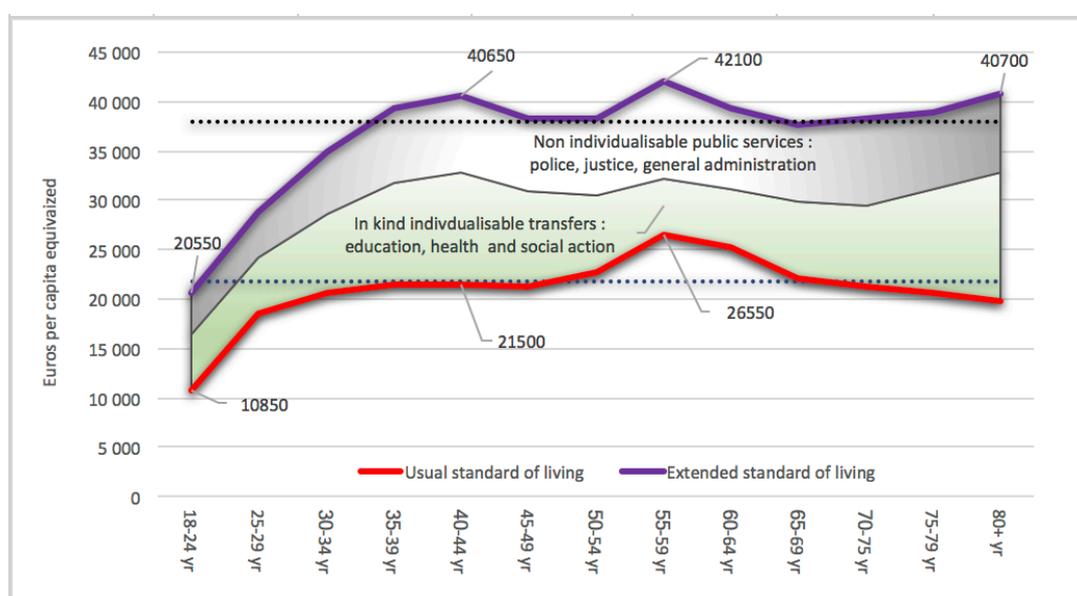
²² In this logic, pensions are added to earnings; for consistency, pension contributions and, where applicable, tax allocated to pension plans, which is the counterpart of this deferred income, are recorded negatively.

B. Income after transfers

If we now come to income after transfers (See Figure 11), and therefore to the standard of living, the profile is very strongly ascending until age 40 and then very stable until age 55; it experiences a slight peak around 55-59 years (€26,550), before decreasing gently after 60 years. The income of 18-24 year olds is just over €10,000 per consumption unit at producer prices (€14,800 at consumer prices).

Given the profile of public services in kind, and in particular the very strong growth in health care expenditure, and therefore in the value constituted by their being free (or almost free), this slope is reversed when we turn to the notion of an extended standard of living. The standard of living of 18-25 year olds is doubled when the monetary valuation of public services is taken into account, so that in the end the dropout of the youngest compared to their elders is just as important from this point of view.

Figure 11 : usual and extended standard of living by age of household reference person

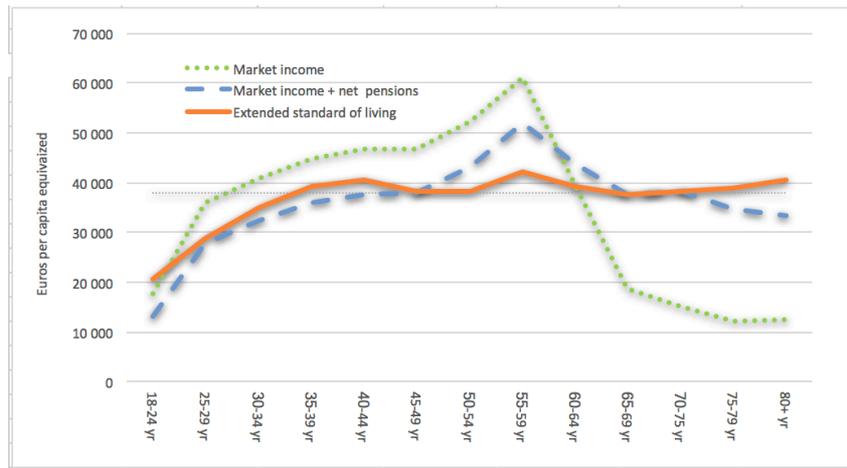


Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

C. Beneficiary from public transfers

If we take stock of the redistribution, we see a seemingly powerful redistribution according to age due to the pay-as-you-go pension system, but in reality, much more modest if we withdraw the contributions and taxes from the working population paid to finance these pensions (see Figure 12). The 50-65 year olds, who are the main beneficiaries of market income, have a positive but modest net contribution to redistribution, to the benefit of the over 75s and 18-24 year olds.

Figure 12 : before and after transfers income by age of household reference person

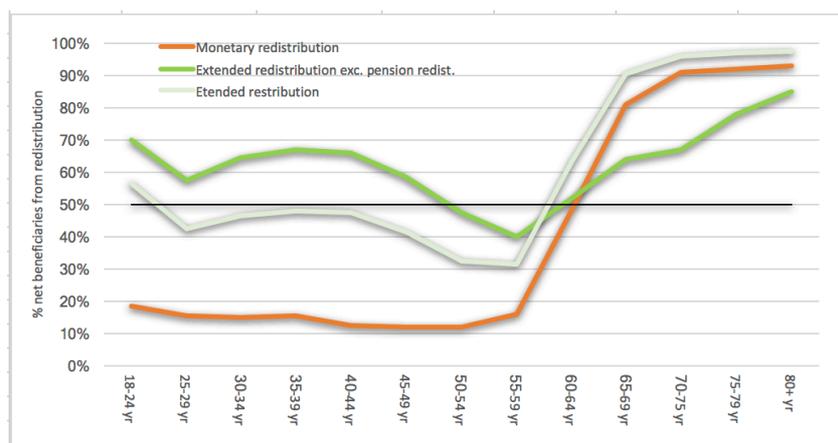


Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

If we now examine this question of "losers" and "winners" from redistribution (see Figure 13 below), at the level of the households themselves and no longer of the age categories of the head of the family, it emerges that from a strict monetary angle, only the over 65s show a proportion greater than 50% of net beneficiaries of the redistribution. Worse still, in working-age categories, the "loser" rate is over 80%. This shows how fundamental the credibility of pension systems is for accepting to contribute to taxes. The tax fed up finds its first source in the distrust of the sustainability of pension schemes.

The situation improves when we include non-monetary transfers – we find more winners in the 18-59 age group, without however tipping into the positive, except for the 18-25 age group. Once the effect of pension schemes has been neutralized, the paradox of horizons fades and all categories (apart from 50-65 year olds) emerge with a balance of more than 50% of net beneficiaries.

Figure 13 : beneficiaries from redistribution by age of household reference person



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

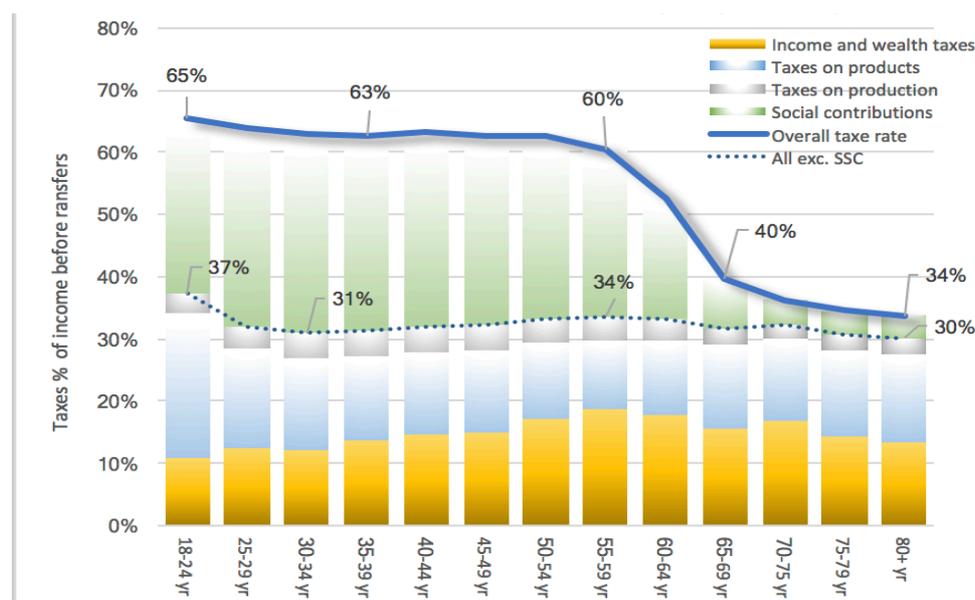
D. Tax rate and structure by age

The overall tax rate (see Figure 14), compared to market income, shows a decreasing profile according to age, slightly for the working age groups (65% for 18-25 year olds to 60% for the 55-59 years) and much more markedly afterwards (40% for the 65-69 year olds, 34% for the over 80s) due to the very sharp reduction in social security contributions. Indeed, the elderly in France contribute much less to social security schemes and through the general social contribution (CSG) which is considered in law as an income tax and classified as such in our distributional national account.

Excluding social security contributions, the profile is fairly flat inverted tilde, with marked regression at the bottom: the rate of taxation is of 37% for those age under 25; it falls at 31% in the 30-34 bracket; then rise to reach 34% for 55-59 year olds to decline to 30% for over the 80s.

Here we confirm the non-progressivity, even the slight regressivity of the French tax system, the origin of which is in the levies on products which represent 19% of their income for the youngest, against 10% for the 55-59 year olds, i.e. roughly the opposite of taxes on income and wealth (9% for 19-25 year olds, 16% for 55-59 year olds).

Figure 14 : fiscal rate by age of household reference person



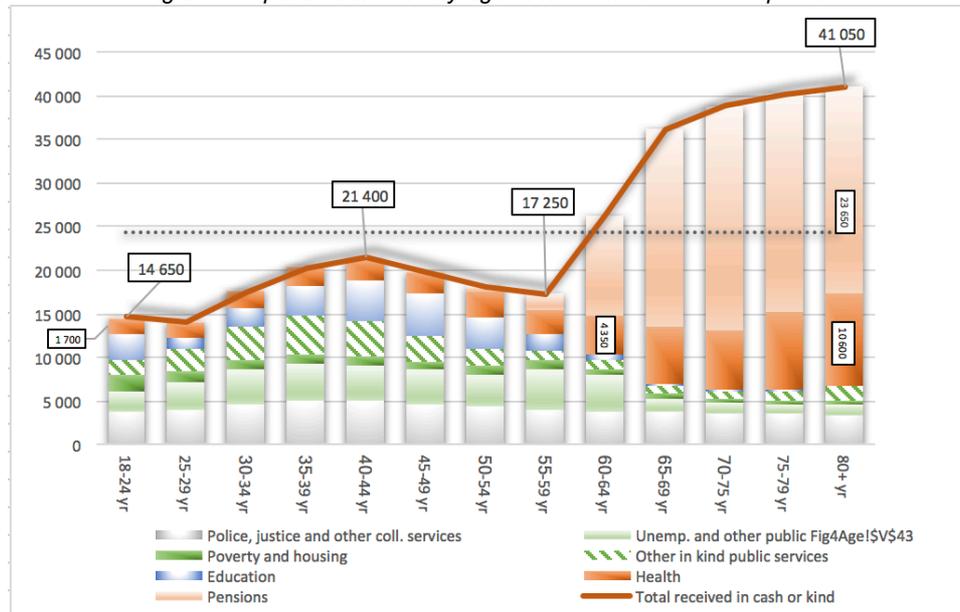
Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

E. Transfers received by age

Contrary to the standard of living approach, the transfers received in cash or in kind are very heterogeneous according to age (See Figure 15). They range from €14,650 for those aged 18-25, who are the least well-off, to €41,050 for those aged 80 and over. For the working-age classes, the profile is bumpy, with a peak for 40-45 year olds at €21,400 and a trough at €17,250 for 55-59 year olds.

Three characteristics of the French social system mainly explain this profile. The clearest and most powerful is the pension system where working generations pay the bulk of the pensions of the wealthiest. Public pensions represent nearly two-thirds of the income of retirees, the rest being made up of income from their savings, particularly real estate (real or imputed if they are owner-occupiers).

Figure 15 : public transfers by age of household reference person

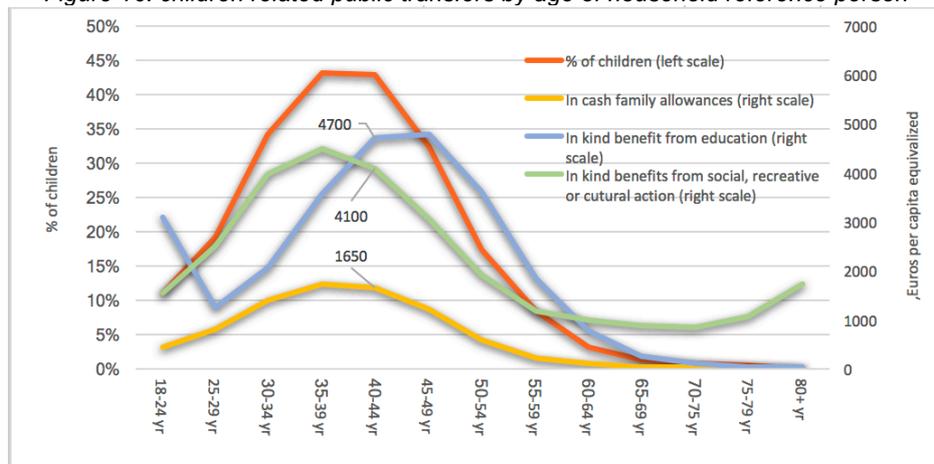


Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

The second characteristic is that of the public health system, which also covers the bulk of healthcare expenditure in France. As the state of health depends on age, the cost of care constitutes a contribution in kind which increases with age. The mechanism is natural, our study shows how powerful it is in terms of redistribution. Health reimbursements progress throughout life, starting at €1,700 per year for 18-25 year olds, rising to €4,350 for people aged 60-64 and up to €10,060 for people aged 80 and over. Health expenditure benefits up to 52% of the over 60s who represent 22% of the population; and still 30% for the over 70s for 10% of the population. For the over 80s, the level of pensions should be increased by 45% so that they can meet the same expenses for the care they benefit from. This also shows that it is impossible to judge the standard of living of retirees, from an inter-temporal perspective or from international comparisons, without integrating a valuation of health expenditure.

Less visible, but nevertheless important, the third mechanism relates to public educational and family policies, and therefore to the presence and number of children in households. Parenthood peaks in France in the 30-50 age group (See Figure 16). For 40-44 year olds, family allowances represent €1,650 per consumption unit. But it is by far the benefit in kind that is the most important for them, school in the lead with an amount of €4,700 per consumption unit, but also other individualized benefit in kind (childcare, sports activities and cultural and other social assistance provided by public administrations), which totals 4,100 euros. In total, €10,450 per consumption unit contribute to the standard of living of 40-45 year olds through these public parenting support policies, of which less than 1/6 is paid in cash.

Figure 16: children related public transfers by age of household reference person



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

VI. Distributional Accounts by Age and Diploma

The homogeneity of standard of living after the age of 35 and throughout life covers, one suspects, a great diversity of situations. To describe the life course, we are going to introduce a major dimension of inequalities, the level of education. Indeed, on the one hand this becomes inherent to the person after leaving the school system and, on the other hand it is also one of the two factors important for the reproduction of inequalities, the other being the transmission of inheritance.

As explained previously, for reasons of the size of our samples, we are going to restrict the age categories to five (18-30, 30-40, 40-50, 50-65 and 65 and over) and introduce five levels of diploma according to the highest level of diploma obtained: no diploma, professional diploma of the 2nd cycle (CAP), baccalaureate, diploma of Bac+2 level of general or professional education (DEUG or BTS), and diploma of Bac+ level 3 or more²³.

A. Income before transfers by age x diploma

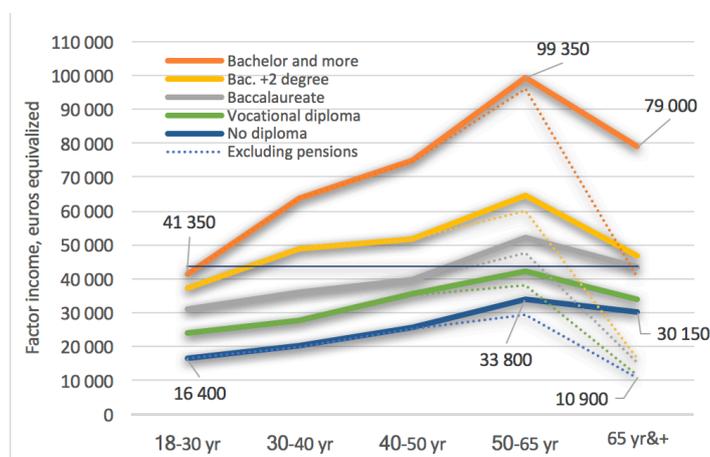
The growing link between market income and age for working people is also found within each of the qualification categories (See Figure 17 and Table 2). Thus for non-graduates, market income goes from €16,400 per consumption unit in the 18-30 age group, to €29,350 (€33,800 if retirement pensions are included); the income from work and capital of Bachelor and more graduates starts at €41,350 in the 18-30 age group to reach €96,000 (99,350 with retirement pensions) in the 50-65 age group.

The range of market incomes tends to widen, upwards, with advancement in life. Bachelor and above receive 3.3 times more market income than non-graduates in the 50-65 age bracket, compared to a ratio of 1 to 2.5 in the 18-30 age bracket. Between the other categories, the gaps tend to narrow slightly. After the Bachelor and more category, whose income is multiplied by 2.4 between the 18-30 and 50-65 brackets, the ratio is 1.8 for

²³ It should be recalled here that, even if the magnitudes are reduced to an individual dimension by applying a coefficient taking into account the size of the families, the basic unit of the accounts by category is the household; the level of diploma referred to is that of the reference person in the household.

non-graduates, 1.6 for vocational diplomas and Bac+2 degrees and 1.5 for holders of a baccalaureate who arrive at the back of the peloton.

Figure 17 : factor income by age and level of education



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

Inequalities in market income by level of qualification are more accentuated for those over 65, with a ratio of 3.7 between those without diploma (€10,900) and those with a bachelor or more (€40,400). Here again, it is from the top that the inequalities are widening. The 11% gap between Bac+2 degree and Bachelor or more degree among 18-30 year olds continues to grow with age (30% for 30-40, 44% for 40-50, 60% for those aged 50-60) to reach 140% in the age group 65 and over. On average, the average income of Bachelor or more, of 68,000 euros per equivalent head, is 1.4 times higher than that of bac+2, 1.9 times higher than that of baccalaureate holders, 2.3 times higher than that of holders of a CAP and 3.6 times higher than that of non-graduates (€18,950).

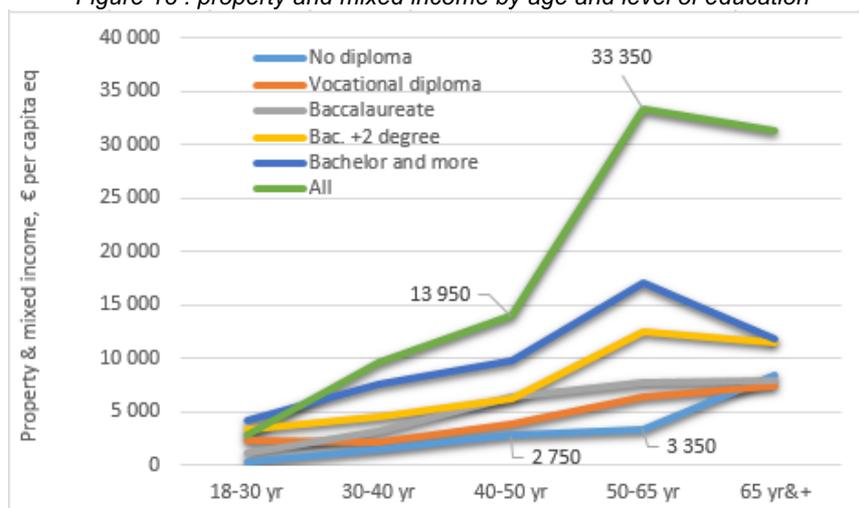
Table 2 : factor income by age and level of education (excluding pensions)

(Unit : euros)	18-30 yr	30-40 yr	40-50 yr	50-65 yr	65 yr&+	All
No diploma	16,400	19,950	25,300	29,350	10,900	18,950
Vocational diploma	23,950	27,650	35,250	38,000	11,700	29,150
Baccalaureate	30,850	35,900	39,450	47,500	15,100	35,300
Bac. +2 degree	37,050	48,650	51,700	60,000	16,650	47,550
Bachelor and more	41,350	63,600	74,700	96,000	40,400	68,200
All	30,450	40,500	45,700	47,650	15,000	36,350

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

This widening of inequalities from top income with advancing age is essentially due to non-wage income (See Figure 18): these jump from €13,950 to €33,350 for bachelor and more between the ages of 40-50 and 50-65 year olds, while for non-graduates, it remains at a very low level (€2,750 between 40 and 50 years old and €3350 between 50 and 65 years old). This increase of €19,500 in capital income comes to the tune of €5,900 from mixed income and €14,600 from capital income (including €9,800 from reinvested profits).

Figure 18 : property and mixed income by age and level of education



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

In total, 10 of the 25 household categories formed by this Age x Education breakdown receive more in primary income than their weight in population (See Table 3). The "market surplus" from which they benefit represents a total of 308 billion euros, of which a third (32%) is concentrated on Bachelor in the 50-65 bracket and 79% on the over 30s in this degree category. Longitudinal market inequalities (according to age) appear much less marked than vertical inequalities (according to the level of qualification). Thus, the cumulative market surplus according to age alone is 98 billion euros (of which 94% in the 50-65 age group and 6% for the 40-50 year olds), compared to 280 billion for the cumulative surpluses depending on the degree.

Table 3 : market income (yc pensions) and market surplus

Unit: €/cap eq pens=mkt (billion € pens=mkt) [billion € pens=trs]	18-30 yr	30-40 yr	40-50 yr	50-65 yr	65 yr&+	All
No diploma	8 (-13) [-11]	24 (-28) [-22]	42 (-31) [-22]	116 (-34) [-28]	195 (-58) [-157]	386 (-163) [-240]
Vocational diploma	19 (-16) [-11]	45 (-27) [-17]	90 (-23) [-5]	172 (-8) [7]	100 (-15) [-68]	427 (-90) [-95]
Bacallaureate	26 (-12) [-6]	57 (-15) [-2]	65 (-9) [+5]	84 (+13) [+20]	58 (+6) [-25]	290 (-17) [-8]
Bac. +2 degree	18 (-4) [0]	51 (+3) [+14]	81 (+11) [+27]	85 (+26) [+35]	33 (+5) [-12]	267 (+41) [+64]
Bachelor and more	34 (-5) [+4]	116 (+32) [+57]	159 (+61) [+94]	182 (+99) [+123]	105 (+52) [+9]	596 (+239) [+287]
All	105 (-52) [-27]	295 (-35) [+30]	440 (+6) [+98]	643 (+92) [+154]	493 (-10) [-255]	1 977 (0) [0]

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

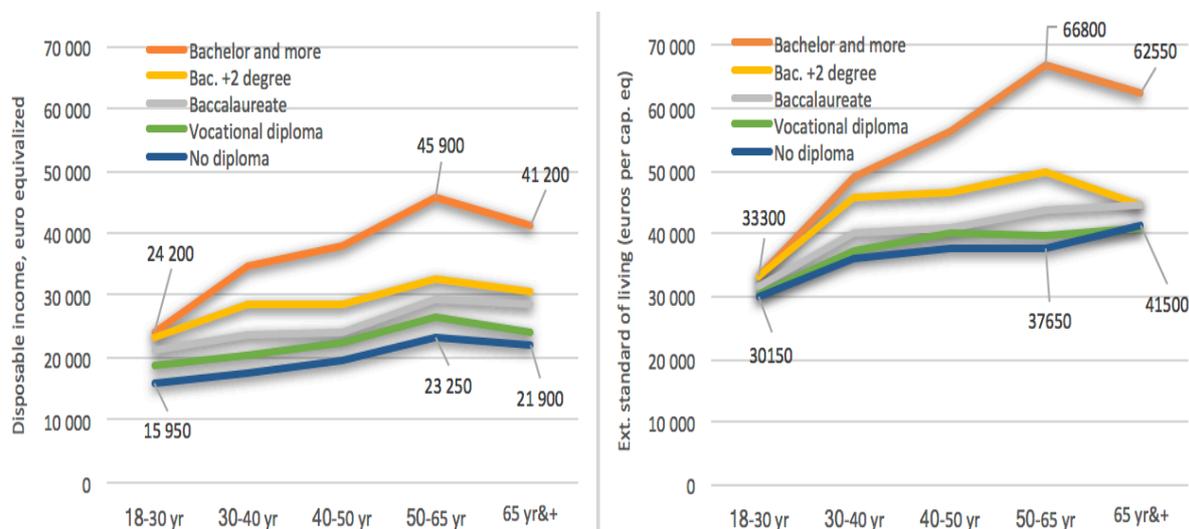
If we no longer include retirement pensions in primary income but as a transfer, 10 of the 25 categories are here also net beneficiaries of the primary distribution of income: the same, minus those over 65 with Bac+2 or Bacalaureate level, to which should be added the 18-30 year olds with a Bachelor level and above as well as the 40-50 year olds with a Bacalaureate level. The cumulative market surplus reaches 380 billion euros, including 350 for the diploma dimension alone and 280 billion euros according to the age criterion alone.

B. Standard of living by age and diploma

After the redistribution operations, the range of income is much narrower (See Figure 19). In terms of usual standard of living (disposable income per capita eq.), the ratio between the most qualified and the non-qualified is 1 to 1.5 in the age group of 18-25 years (respectively €24,200 and €15,950 per capita eq.) against 1 to 2.5 for primary factor income; in the 50-65 age group, the high/low ratio amounts to 2 in disposable income (respectively €45,900 and €23,250), against 3.3 in market income.

In terms of profile over the life cycle, the progression concerns all categories, but is almost twice as high for bachelors and more (+89% for the 50-65 age group compared to 18-30 years old, i.e. almost 2% per year) and around 1% per year for the other categories (+46% for non-graduates, between +39 and +40% for the others). All the categories then experience a slight decline, the gap between the category of 50-65 and 65 and over (which is a pseudo "replacement rate") ranging from 3 to 10% depending on the level of diploma. It should be noted that on average, the income of the over 65s is 13% lower than that of the previous age category due to a composition effect, non-graduates being more represented in the categories of inactive age.

Figure 19 : disposable income and extended standard of living by age and diploma



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

The gaps are even narrower when integrating the non-monetary elements of the redistribution, with only 10% difference in extended standard of living between non-graduates and Bachelor and more (compared to 50% in usual standard of living and 150% in primary income). The increase of the extended standard of living with age, between

the two extreme categories of active age, is on the other hand only 25% for the no diploma group (+0.6% per year) against a doubling for the most graduates (and +30% for vocational diploma, +39% for baccalaureate, +50% for Bac+2 degree). Among 50-65 year olds, the standard of living for bachelors and more is €66,800 per capita eq. compared to €37,650 for non-graduates.

C. Net beneficiaries from redistribution

If we consider pensions as a transfer, the horizontal redistribution reaches 269 billion euros, to the benefit of the single category of over 65s (See Table 4). On the other hand, as seen above, the balance sheet of redistribution operations, considering pensions as (deferred) market income, shows a not very marked profile according to age, ranging from a positive balance of 3,600 per year and per capita eq. for 30-40 year olds and under to a negative balance of €5,550 per year and per capita eq. for 50/65 year olds. In total, 71 billion euros are distributed between the 50-65 year olds, debtors, and the other categories.

Table 4 : extended redistribution by age and diploma (pensions as market income)

Unit: €/cap eq pens=mkt (billion € pens=mkt) [billion € pens=trs]	18-30 yr	30-40 yr	40-50 yr	50-65 yr	65 yr&+	All
No diploma	13,700 (6,8) ((4,8))	16,500 (19,7) ((14,2))	12,800 (21,8) ((12,7))	4,500 (15,8) ((9,5))	8,400 (49,7) ((149,0))	8,900 (113,7) ((190,1))
Vocational diploma	7,500 (6,0) [1,6]	10,350 (17,6) [7,4]	6,100 (16,1) [-2,4]	-1,350 (-5,6) [-20,9]	3,600 (9,7) [62,7]	3,650 (43,8) [48,4]
Baccalaureate	2,300 (2,0) [-3,9]	5,950 (10,0) [-3,1]	3,450 (6,0) [-8,2]	-6,850 (-11,5) [-18,8]	-3,100 (-3,8) [27,5]	400 (2,7) [-6,4]
Bac. +2 degree	-1,500 (-0,8) [-4,8]	-250 (-0,3) [-11,3]	-2,650 (-4,4) [-20,7]	-11,900 (-16,3) [-25,4]	-6,650 (-4,2) [13,1]	-4,900 (-26,0) [-49,1]
Bachelor and more	-4,250 (-3,9) [-12,8]	-9,950 (-19,6) [-45,7]	-13,200 (-30,1) [-63,3]	-27,950 (-53,6) [-77,1]	-21,900 (-27,3) [15,9]	-16,150 (-134,5) [-182,4]
All	2,750 (10,1) [-15,3]	3,600 (27,7) [-38,1]	950 (9,4) [-82,4]	-5 550 (-71,1) [-133,1]	2 050 (23,9) [268,8]	0 (0) [0]

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

The intergenerational redistribution of the French social system mainly involves pensions. The vertical redistribution is greater (150 billion euros excluding pensions, 238 billion including transfers linked to pension systems), with a positive net balance of €8,900 for non-graduates and a negative balance of -€16,150 for the most graduates.

When the two dimensions are combined, between 13 and 14 of the 25 categories are net contributors to the broader redistribution, for an amount of 318 billion euros transferred to the other categories. The map of "winners" from the primary income distribution almost overlaps with that of the losers from redistribution.

D. Taxes, SSC and benefits by age x diploma

Unsurprisingly given the proportional profile of overall taxes, levies and social security contributions, they range from €11,150 for 18-30 year olds without a diploma to €57,800 for 50-65 year olds a bachelor's degree or higher (See Table 5).

Table 5 : total taxes paid by age and diploma

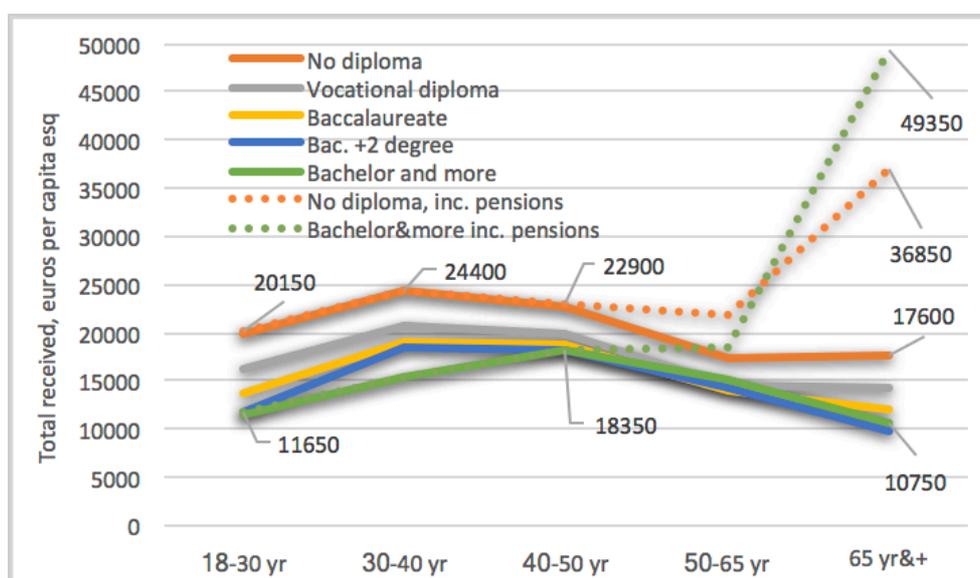
(Unit : euros)	18-30 yr	30-40 yr	40-50 yr	50-65 yr	65 yr&+	All
No diploma	11 150	13 300	16 100	19 550	12 050	14 750
Vocational diploma	14 900	17 050	21 300	24 100	13 650	19 550
Baccalaureate	18 700	21 600	23 900	29 750	17 950	23 100
Bac. +2 degree	21 600	28 900	31 050	37 200	19 550	29 900
Bachelor and more	25 750	38 400	45 850	57 800	36 550	43 250
All	18 750	24 650	27 900	29 850	16 050	24 150

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

All benefits in cash or in kind combined, the transfers paid to households display an inverted U-shaped profile for all level of qualification (See Figure 20). The transfers received represent €20,150 per year and per capita eq. for non-graduates aged 18 to 30. They increase to €24,400 for the 30-40 age group, before falling back to €17,600 per year and per capita eq. For the most educated, the peak is €18,350 in the 40-50 age bracket, compared to €11,650 at the start of working life and €10,750 for those over 65.

If we consider pensions as a transfer, the curves take on a tilde shape. Pensions account for 79% of benefits in cash and in kind received by the most educated over 65s; for non-graduates, the proportion is 55%.

Figure 20 : transfers received by age and diploma



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

As we have already seen, the health system makes a powerful contribution to reducing inequalities a given year. This appears even more strongly here (See Table 6). Not only is health expenditure highly concentrated on the oldest age groups, but it also varies

considerably within an age category. Healthcare reimbursements is 70% higher for non-qualified than for the most qualified, and even 115% higher for those aged 65 and over where it reaches €10,000 per year and per capita equivalized for non-graduates. Of the 184 billion euros in health expenditure in 2019, 1/3 (61 billion euros) benefited the single category of non-graduates over 65 years old. This proportion reaches 60% (110 billion euros) if we include those over fifty without a diploma or with a vocational diploma.

Table 6 : benefits in kind from health system by age and diploma

Unit: €/cap eq (billion €)	18-30 yr	30-40 yr	40-50 yr	50-65 yr	65 yr&+	All
No diploma	2,200 (1,1)	2,350 (2,8)	3,100 (5,3)	4,400 (15,4)	10,000 (60,8)	6,650 (85,3)
Vocational diploma	1,550 (1,3)	1,750 (2,9)	2,700 (7,2)	2,950 (12,5)	7,850 (21,1)	3,750 (45,0)
Baccalaureate	1,850 (1,6)	1,850 (3,1)	2,050 (3,5)	2,750 (4,6)	5,000 (7,3)	2,800 (20,2)
Bac. +2 degree	1,500 (1,5)	2,350 (2,9)	1,750 (4,3)	3,050 (5,7)	3,900 (5,8)	2,450 (20,2)
Bachelor and more	1,650 (6,2)	1,500 (14,4)	1,900 (23,2)	2,950 (42,3)	4,650 (97,4)	2,400 (183,6)

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

This monetary valuation measures the redistribution carried out in kind by the health system, but also the health inequalities themselves: if non-graduates use the health care system more, it means that they are more exposed to disease. This is also the reason why the monetary valuation of sickness expenditure in assessments of the standard of living is a debated issue. It only finds its place in a broader approach to income and it means that in the absence of free care, health expenditure would have been imputed to purchasing power.

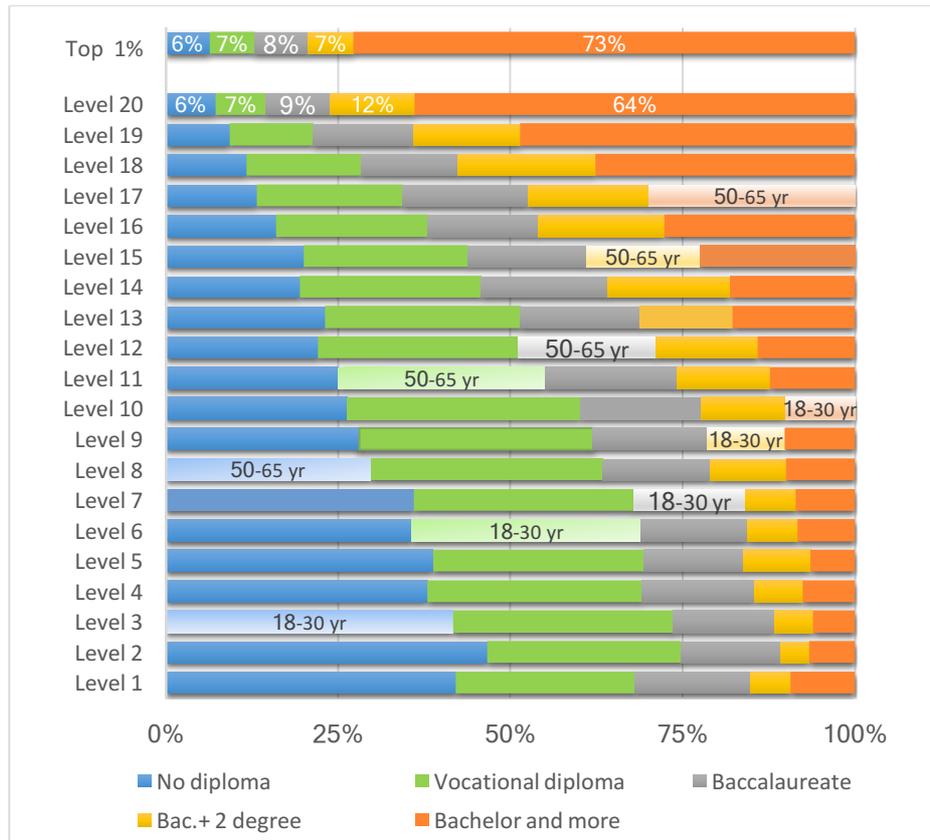
E. Position on the social ladder by diploma and age

In the end, this examination of inequalities from the perspective of the pseudo life cycle, through the distribution of national accounts by categories of households crossing age and diploma, usefully completes the study according to income categories alone. It offers a more dynamic vision of the courses (See Figure 21).

On a scale of 1 to 20 corresponding to the standard of living twenty-tiles, non-graduates would be, on average, at level 3 at the start of their career (18-30 years) and would reach level 8 at the end of their career. On the other hand, the pseudo career of holders of a bachelor's and more level diploma begins directly at level 10, and ends in the 50-65 bracket, at level 17.

Between the two, the pseudo career of vocational diploma are between level 6 and level 11, that of baccalaureate holders between level 7 and level 12, and that of Bac+2 goes from level 9 to level 15. Among those who reach level 20, we find 64% of Bachelor and more against 6% of non-graduates.

Figure 21 : position on the social ladder by âge and diploma



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

F. Pseudo-lifelong table of integrated accounts

In this section we look at data in a logic that can be described as a pseudo-life cycle, where income observed in section is used as a proxy for income throughout life, and we take into account life expectancies by level of qualification.

From a pseudo-life cycle perspective (see Table 7), and with all the precautions expressed above on identifying with individual careers, a “pseudo-career” at Bachelor and more level “brings” €4,845,000 in primary income; the cumulative amount of taxes is 2,835,000 for €1,855,000 of benefits received in cash or in kind. The standard of extended life stood at 3,850,000 “lifelong”, or 80% of market income.

Opposite to the diploma scale, “lifelong” primary incomes are 1,620,000 for those without diploma (ratios of 1 to 3 for the most qualified); the deductions of €950,000 for €1,740,000; and ultimately an extended standard of living of 2,450,000 or 150% of market income per capita eq. In this logic, the “pseudo-return” of a bachelor’s degree or higher is over a lifetime, compared to no diploma, is of 3,200,000 in terms of primary income, and 1,400,000 after transfers operations.

Table 7 : pseudo-lifelong table of integrated distribunal account

(Unit : euros)	No diploma	Vocational diploma	Baccalaureate	Bac. +2 degree	Bachelor and more	Bachelor+ / no diploma
Market income (1)	1,620,000	2,110,000	2,600,000	3,190,000	4,845,000	3,0
<i>Factor income</i>	<i>1,295,000</i>	<i>1,725,000</i>	<i>2,160,000</i>	<i>2,695,000</i>	<i>4,220,000</i>	<i>3,0</i>
Net benefits	790,000	430,000	180,000	-195,000	-975,000	
<i>Taxes</i>	<i>-950,000</i>	<i>-1,200,000</i>	<i>-1,510,000</i>	<i>-1,825,000</i>	<i>-2,835,000</i>	<i>3,0</i>
<i>Benefits</i>	<i>1,740,000</i>	<i>1,630,000</i>	<i>1,690,000</i>	<i>1,630,000</i>	<i>1,855,000</i>	<i>1,1</i>
Ext. std of living (2)	2,450,000	2,565,000	2,800,000	3,000,000	3,850,000	1,6
<i>Usual std of living</i>	<i>1,325,000</i>	<i>1,540,000</i>	<i>1,785,000</i>	<i>1,980,000</i>	<i>2,625,000</i>	<i>2,0</i>
(2)/(1)	1,5	1,2	1,1	0,9	0,8	

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

In longitudinal section, our pseudo "long life" indicator results in a total amount of taxes and SCC of €950,000 for non-graduates, €1,200,000 for holders of a professional secondary education diploma, €1,510,000 for a bachelor's degree, €1,835,000 for a BTS or a DEUG and €2,835,000 for the bachelor and more category. Taxes, contributions and SSC represent over the pseudo life cycle between 57 and 58% of "lifelong" income depending on the level of diploma, confirming the absence of progressiveness of tax in France already highlighted above.

The tax structure is very different (See Table 8): if taxes on income and wealth represent 22% of pseudo-lifelong income for the most qualified, against 14% for those without diplomas, the figures are exactly the opposite for the taxes on products and production, 14% for bachelor and more and 22% for less qualified. Not only do the less educated contribute very significantly through taxes, contrary to popular belief, in particular due to social contributions on income (CSG, CRDS), but they are also fully subject to the regressive profile of taxes on products.

Table 8 : pseud- lifelong fiscality by diploma

(Unit : euros)	Taxes on products and production	Taxes on income and wealth	Social Security Contribution	Total taxes	% income before transfers	% total income before taxes
No diploma	355,000	220,000	370,000	950,000	58%	40%
Vocational diploma	415,000	285,000	505,000	1,200,000	57%	42%
Baccalaureate	480,000	430,000	600,000	1,510,000	58%	43%
Bac.+2 degree	530,000	545,000	755,000	1,825,000	57%	45%
Bachelor and more	675,000	1,085,000	1,070,000	2,835,000	58%	48%

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

In terms of transfers received (See Table 9), pensions, the amounts of which range from €435,000 for non-graduates to €915,000 for bachelors and more, and constitute over the pseudo life cycle, the main benefit (and first compensation for tax) for all degree categories. They are followed by social benefits in cash, which range from €210,000 for bachelors and more to €350,000 for non-graduates, then by healthcare reimbursements (from €200,000 for bachelors and more to €340,000 for non-graduates).

In total, non-graduates receive €1,740,000 “lifelong”; at the other end, bachelors and more receive “lifelong” €1,855,000; between the two, the amount are slightly lower. Pensions represent 49% of the counterpart to the tax for bachelor and more, against 22% for non-graduates. Conversely, social benefits in cash and health represent 40% of transfers received by non-graduates compared to 22% for bachelors and more. Excluding pensions, the transfers received by households show a decreasing profile according to the level of diploma, ranging from €945,000 for the most qualified to €1,305,000 for those without a diploma.

Table 9 : pseudo-lifelong transfer received by nature and diploma

(Unit : euros)	Pensions	Other in cash	Health	Education	Other in kind	Total	Total exc. pensions
No diploma	435,000	350,000	340,000	125,000	460,000	1,740,000	1,305,000
Vocational diploma	520,000	270,000	265,000	120,000	435,000	1,630,000	1,110,000
Baccalaureate	680,000	240,000	230,000	135,000	415,000	1,690,000	1,010,000
Bac.+2 degree	705,000	210,000	185,000	140,000	400,000	1,630,000	930,000
Bachelor and more	915,000	210,000	200,000	150,000	395,000	1,855,000	945,000

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

VI. Other Dimensions of Market Inequalities and Redistribution

A. Family structure

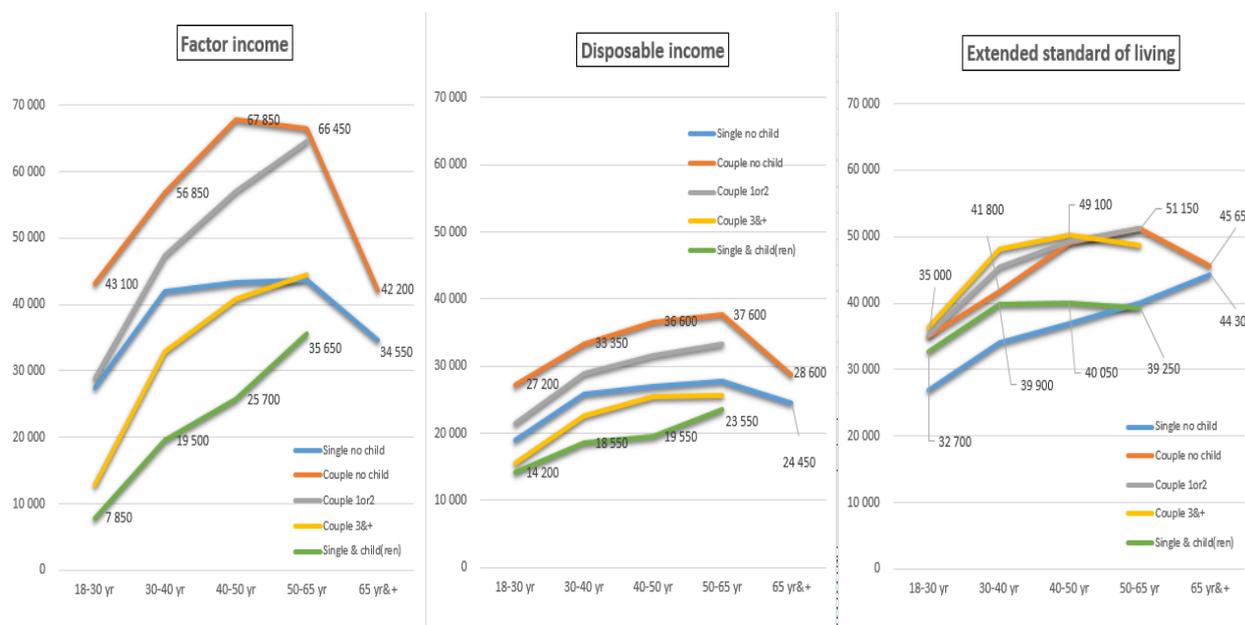
Numerous type of transfers, such as education or family allowances, income tax, are based on the family structure of the household. This latter evolves with age and plays also a key role on the inequalities. The expanded redistribution can be implemented in other dimensions than just income group. This section gives results on distributional accounts established according to age, crossed with family structure. We distinguish between six types of households: single people without children, couples without children, couples with one or two children, couples with three children, complex households (eg presence of three adults) and single people with children.

The poorest households in terms of primary income per capita eq. (See Figure 22) are single people with children (€28,000 per capita eq.), followed by couples with three or more children (€37,000 per capita eq.). The best off are couples without children (€51,500 per capita eq). Couples without children have a primary income per capita eq three times higher for the 18-30 age group (respectively €14,000 and €42,500), which tends to decrease with age.

As already showed, public transfers significantly reduce primary inequalities. This also can be seen with a family type analysis. The extended living standards of couples are very similar regardless of the number of children. Thus, while the market incomes of couples without children are 40% higher than those of couples with three or more children (respectively €51,500 and €37,000 per capita eq), the extended living standards are equivalent (respectively €45,000 and €48,500). With regard to single people with children, the gap is very small in the 18-30 age group (€39,000 or 13% difference with the €45,000 for couples), but it tends to widen with age to reach 25% in the 50-65 age group. The single without child, in the middle of the table in terms of primary income, find themselves at the back of the pack in terms of extended standard of living. Non-monetary transfers contribute very strongly to this spectacular convergence of living

standards. If we look at the usual standard of living, integrating only monetary redistribution, the hierarchies of market inequalities remain unchanged, with differences nevertheless significantly reduced.

Figure 22 : market income and extended standard of living by household type



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

The main contributors to inter-family redistribution are childless couples (See Table 10). The balance between the benefits they receive in kind or in cash and the taxes they pay is -76 billion euros, of which 53% for the 50-65 year olds of this family category alone. Couples with one or two children over the age of 40 contribute 59 billion euros net of transfers received and single people without children between the ages of 30 and 65 contribute 13 billion euros. The main beneficiary families are single people with children (57.8 billion euros received net of tax) and couples with three or more children (44.3 billion euros net received).

Table 10 : extended redistribution by household type

Extended redistribution (billion of euros)							
	Without child		With child(ren)				All
	Singles	Couples	Couple 1or2	Couple 3&+	Complex	Single	
18-30 yr	1,9	-6,0	4,9	2,0	2,1	5,9	10,9
30-40 yr	-5,0	-8,5	0,5	16,3	1,2	18,1	22,6
40-50 yr	-3,6	-8,2	-20,5	20,6	1,5	25,5	15,2
50-65 yr	-5,3	-49,5	-39,4	4,6	0,7	5,4	-83,6
65 yr&+	31,7	-4,1	1,0	0,8	2,6	2,8	34,8
All	19,6	-76,3	-53,6	44,3	8,2	57,8	0,0

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations. Computed at macro level between the 25 categories of households.

B. Gender issues

A complete analysis of inequality and redistribution between women and men is out of the scope of the paper because it requires the allocation of income between them within couples. Our data does not allow us to do it properly because it needs to individualized capital income, taxes and all the benefits that are shared at the household level (see André and Sireyjol 2021 for a study only on the French income tax). We will limit ourselves here to single adult individuals, for whom the distribution of income between couple does not arise.

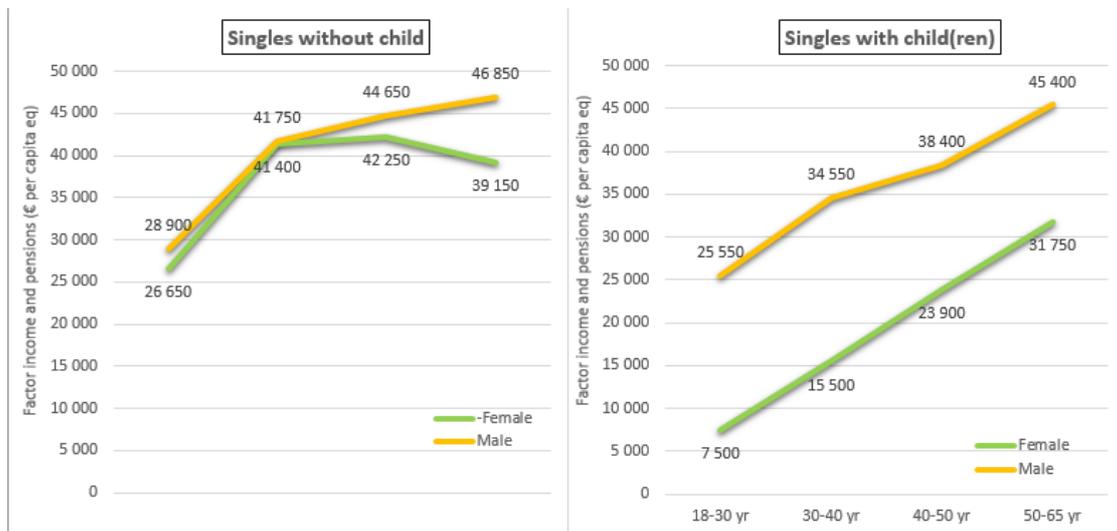
Table 11 : female / male income ratio by age group for singles with ou without child

	Male vs female income			
	Single without child		Single with child(ren)	
	Factor income	Disposable income	Factor income	Disposable income
18-30 yr	+8%	+9%	+241%	+61%
30-40 yr	+1%	+4%	+123%	+62%
40-50 yr	+6%	+8%	+61%	+45%
50-65 yr	+20%	+16%	+43%	+37%
65 yr&+	+19%	+14%	0%	+6%
All	+15%	+7%	+68%	+46%

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

For **singles without children**, market incomes are quite close in the 18-30 age group: factor income (labor, mixed and capital) is €28,900 for men and €26,650 for women, i.e. a 8% difference (See Figure 22, 23 and Table 11). This gap increases with age to reach 20% in the 50-65 age group. This deepening covers two phenomena, well documented elsewhere, but which our data do not allow us to distinguish: one is intergenerational, the slow but real reduction in wage inequalities in employment, and the other linked to changes slower careers for women.

Figure 23 : market income for single male and female, without (left) or with child (right)

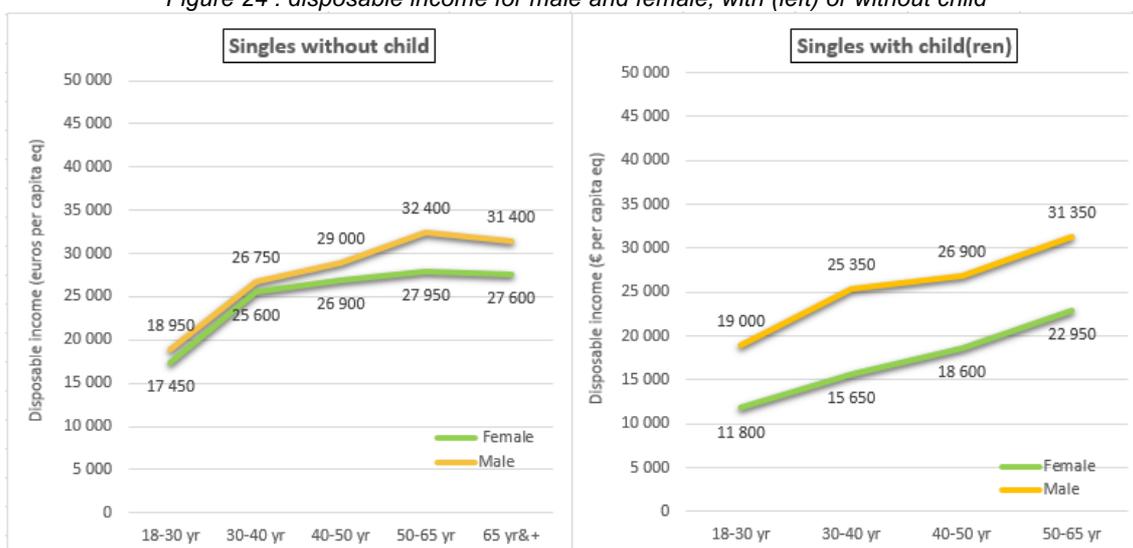


Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

For **single people with children**, the gap in market income is massive: single women with children (90% of single people with children) receive on average only €7,500 in factor income at age 18-30, compared to €25,500 for men, i.e. a ratio of 1 to 3 and a half. This gap between women and men among single persons with children decreases with age, while remaining at 43% in the 50-65 age group. On average across all age groups, the market income of single men with children is 68% higher than those of women.

Monetary redistribution very significantly reduces this gap in terms of standard of living, which nevertheless stands, for single men with children, at 61% above that of women in the 18-30 age bracket, and 37% among 50-65 year olds. Childless men disposable income is 7% in disposable income over childless men, compared to +15% in market income.

Figure 24 : disposable income for male and female, with (left) or without child



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

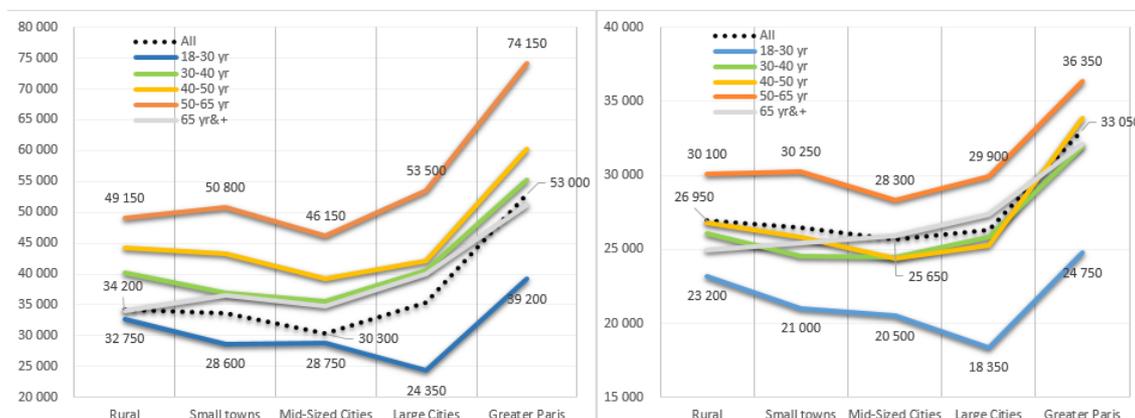
C. Area of residence

The yellow vests crisis has sometimes been described as a "revolt" of the inhabitants of medium-sized cities, "victims of globalization" against those of the large metropolises who would be "winners of globalization". In this section, we document the issue on the income aspect, by examining how the size of the municipality of residence impacts primary incomes and redistribution. In what follows, the "rural" category refers to rural municipalities with less than 20,000 inhabitants, "small towns" refers to municipalities with less than 20,000 inhabitants, mid-sized cities to agglomerations of 20,000 to 200,000 inhabitants, large cities to areas with more than 200,000 inhabitants, and "Greater Paris" to the urban area of the Paris region.

Incomes are indeed the lowest in medium-sized cities (See Figure 25), without the gaps being massive, with the notable exception of those in Greater Paris. Thus, the average disposable income is €25,650 in mid-sized cities, €26,350 in "large cities", €26,450 in small-cities and €26,950 in rural municipalities. In market income, the differences are slightly larger: 30,300 for mid-sized cities, 41,500 for small towns, 41,650€ for rural areas

and 42,450€ for large cities. This U-shaped profile is found in all age categories, with the exception of 18-30 year olds for whom the standard of living is minimal in large cities, and retirees whose standard of living increases with the size of their the municipality of residence.

Figure 25 : before transfers income²⁴ and disposable income by size of area of residence and age



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

Households residing in Greater Paris receive 54% of primary income than those in Mid-Sized Cities (See Table 12). The gap is greatest in the 50-65 age group where it reaches 61%. Redistribution narrows this range by almost half, with the standard of living of Greater Paris residents standing at 29% (+23% in extended standard of living) above that of the inhabitants of the “Mid-Sized Cities” (respectively 33,050 € per capita eq against €25,650). The difference is greatest in the 40-50 age group: it reaches 39% (€33,900 against €24,400). For a 45-year-old couple with two children, disposable income after cash transfers is, on average, €7,100 per month in Greater Paris, compared to €5,100 in a mid-sized city.

Table 12 : Greater Paris / Mid Sized Cities by age of household reference person

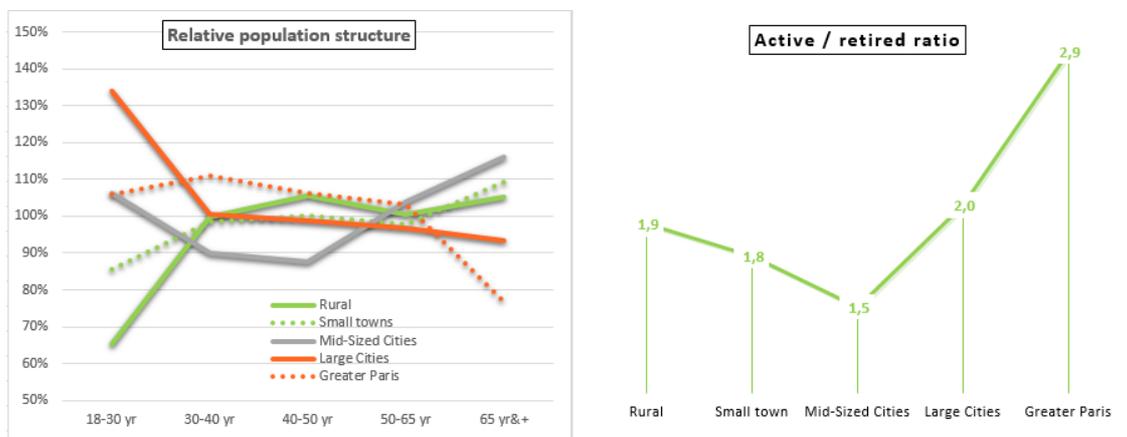
	Factor income and pensions	Disposable income	Extended disposable income	Greater Paris / Mid-Sized population
18-30 yr	136%	121%	113%	108%
30-40 yr	155%	130%	117%	132%
40-50 yr	154%	139%	125%	123%
50-65 yr	161%	128%	131%	98%
65 yr&+	147%	124%	120%	68%
All	154%	129%	123%	100%

Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

²⁴ Here market income designs factor income plus pensions

The place of residence changes very significantly when considering age of individuals (See Figure 26). Big cities, and to a lesser extent Greater Paris, are over-represented among young people who come to pursue their studies there. This is also an explanation for the fall in disposable income and standard of living that we mentioned above for 18-30 year olds in this category of municipality. Conversely, young people are under-represented in rural communes and small towns. The structure is reversed for those aged 65 and over: they are strongly under-represented in Greater Paris and to a lesser degree in the “Large Cities”, to the benefit of less dense areas and move to location with lower housing prices. In between, Mid-Sized Cities have a U-shaped age profile, with a dip in the 30-50 age bracket. This is the only category where this age group is under-represented. Mid-Sized cities are more the place of residence for retirees. These cities have 2 retirees for 3 working people, compared to 1 retiree for 3 working people in Greater Paris.

Figure 26 : Greater Paris / Mid Sized Cities by age of household reference person



Source: INSEE, National Distributional Accounts, 2019. Authors' Calculations.

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ANNEXE

Table A1 : table of integrated distribution accounts nomenclature

Table of integrated distributional accounts			Table of integrated economic accounts	
DNA	First level	Second level		
A	Net national income before transfers (1+2+3+4)		S1	B5n
1	Gross labor income	1.1 Net Wages 1.2 Social Contributions	S14	D1
2	Net mixed income and property income	2.1 Net mixed income 2.2 Net property income 2.3 Actual and fictitious rents, net of charges	S14 S14 net S14	B3n D4 B2n
3	Retained earnings and other corporate	3.1 Retained earnings net of corporate income tax 3.2 Corporate income tax 3.3 Other corporate transfers (fraud)	S11+S12+S15 S11+S12 S11+S12 net	B5n-D5-S7 D5 D6+D7
A.fac	Factor income (= 1+2+3)			
4	Primary income of the public authorities	4.1 Levies on production and consumption 4.2 Property inc. and net EBITDA (inc. interest paid)	S13 S13+S12 net	D2+D3, res. D4
	Monetary transfers (5.1+5.2+6+7+8+9)			
5.1	Taxes on products	5.1.1 VAT 5.1.2 Oil and energy taxes 5.1.3 Alcohol, tobacco and insurance 5.1.4 Registration and construction 5.1.5 Other net subventions on products	S13 S13 S13 S13 S13	D21N D21N D21N D21N D21N
5.2	Taxes on production	5.2.1 Corporate production taxes on wages 5.2.2 Corporate production tax on building 5.2.3 Household production tax (TFPB...) 5.2.4 Corporate subventions on wages (CICE)	S13+S2 S13+S2 S13+S2 S13+S2	D2-D3 D2-D3 D2-D3 D2-D3
6	Taxes on income and wealth	6.1 Generalized Social Contribution 6.2 Households income tax 6.3 Corporate income tax 6.4 Housing tax 6.5 Solidarity tax on wealth 6.6 Social debt repay. (CRDS), wealth inc. social tax	S14 S14 S11+S12 S14 S15 S14	D5 D5 D5 D5 D5 D5
7	Social contributions	7.1 Pensions 7.2 Health 7.3 Family 7.4 Unemployment 7.5 Specific welfare schemes	S14 S14 S14 S14 S14	D61 D61 D61 D61 D61
8	Benefits in cash	8.1 Pensions 8.2 Unemployment 8.3 Family 8.4 Disability 8.5 Mutual 8.6 Compensation for daily sickness or accident at work	S14 S14 S14 S14 S14 S14	D62 D62 D62 D62 D62 D62
9	Other secondary transfers	9.1 Other current transfers 9.2 Property income and net EBITDA	S14 S13 net	D7 D4+EBEn
B	Disposable income (1+2+3+4+5.1+5.2+6+7+8+9)		S14	B6n
B.micro	Disposable income (usual micro definition: 1.1+2.1+2.2+6 -6.5+8)			
	Non-monetary transfers (10+11+12+13)			
10	Benefits in kind (individualizable social security transfers in kind)	10.1 Health 10.2 Education 10.3 Social welfare 10.4 Cultural and associative activities 10.5 Housing allowances	S13 S13 S13 S13 S13	D63 D63 D63 D63 D63
11	Benefits from collective public services (collective expenditure)	11.1 General administration 11.2 Police, justice, defense 11.3 Other (of which dissemination of research)	S13 S13 S13	P32 net P32 net P32 net
12	Other (net adj. disp. inc. of pub. auth. and rest of the world)	12.1 Net adjusted disposable income of NPISH 12.2 Rest of the World Use-Resource balance (EU..)	S15 S2	B7n-B5n B6n-B5n
13	Net sav. of pub. auth. net of FCC	13.1 Net saving of public authorities net of FCC	S13	B8n
D	Income after transfers (B+10+11+12+13) → Extended standard of Living		S1	B5n

Notes : A “DNA” (distributed national accounts) nomenclature has been established to facilitate comparisons, with a low level distinction to be able to issue either simplified or detailed TIDA. The following tables collate the accounting rules that allow this initial contraction of the TIEA to be performed.

The capital letters indicate the different income concepts: DNA.A is **Net national income before transfers** (NNIBT). DNA.A.fac is the labor and capital factor income, DNA.B is disposable income, DNA.C is adjusted disposable income and DNA.D is income after transfers (NNIAT), which has also been referred to as expanded income above.

The table A1 represents the rows in the table of integrated economic accounts in the order in which the economic accounts appear.

Income before transfers (NNIBT) is calculated by adding the primary income of the public authorities (DNA.4), which is primarily comprised of taxes on products and production, to **factor income** – remuneration for labor (DNA.1), property (DNA.2) and retained corporate income (DNA.3).

Since the key objective of this distributional accounting is to document the transfers performed by means of redistribution, the rows of the TIDA that relate to transfers are broken down into sub-headings, each identified by a second number (e.g. DNA.2.1 refers to the mixed income of the self-employed within the DNA.2 group).

As with the TIEA, the sequence of accounts in the TIDA continues, from the top to the bottom of the table with the secondary distribution of national income account. The taxes taken from income before transfers, i.e. taxes on income and wealth (DNA.6) and social security contributions (DNA.7) are subtracted. Since a single column is used to represent both resources and uses, where the amounts appearing here relate to transfers paid out, they include a minus symbol.

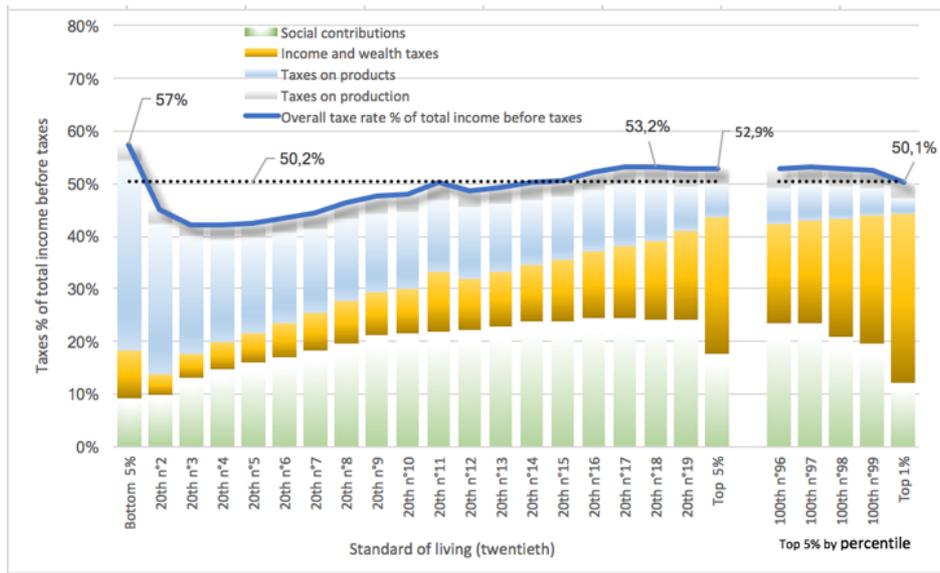
The sequence continues with the recording of transfers received, grouped into the “monetary benefits and allowances” (DNA.8) and other transfers (DNA.9) categories to arrive at net disposable income (DNA.B). This concept of net disposable income differs slightly from that of household disposable income in the national accounts, in so far as it includes retained company earnings. To insure DNA and micro comparisons, we also calculate a disposable income strictly corresponding to the micro-founded definition (DNA.B.micro).

We arrive at income after transfers by applying a monetary value to non-monetary services rendered by the public authorities, which fall under the use of income account as collective consumption expenditure in the TIEA:

- individualizable public services, such as health, education and social welfare in particular, grouped together in the national accounts in the category of “individualizable social security transfers in kind” (DNA.10);
- other services provided by means of public policy, described in non-individualizable national accounts as security, justice, national defense and general administration expenditure in particular (DNA.11).

The first of these two steps results in the concept of net adjusted disposable income, which is well known to national accountants (in this case DNA.C or DNA.C.sna depending on whether or not retained earnings are included). The allocation of collective expenditure to households, together with the net adjusted disposable income of other sectors (DNA.12), gives the net national income after transfers (DNA.D), also called latter, extended standard of living.

Figure A1 : overall fiscal rate by twentieth of standard of living (% of total income before taxes)



Source: INSEE, Distributional National Accounts, 2019. Authors' Calculations.